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# Computer Weekly

Thursday, July 1, 1982

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## Informatics may handle Personal Computer

by Claire Gooding  
PLANS to incorporate the IBM Personal Computer into its software strategy were revealed by Informatics last week. The multi-million dollar company signalled its intention as it announced its European headquarters had moved to the UK.

It expects the IBM Personal Computer to play a major part in large data processing shops in the next few years.

Informatics chairman and president Walter Bauer speculated that the day might come when Informatics would act as a dealer selling its software applications on the PC machine.

"Market research figures show that the IBM Personal Computer is selling to the Fortune 100 market more than any other," said Bauer. "It's our job to service that market, and that means not just mainframe software but extending to

the micro as well.

"We in the computer services industry will have the marketplace to ourselves. The pattern emerging is that services sell hardware. Since we already sell applications, with 10% more effort we could sell hardware as well," said Bauer, who predicts \$10 million worth of hardware sales for Informatics in 1982.

In the US Informatics has already gone some of the way towards building software which will turn a microcomputer into a programmer's workbench, a terminal, or an end-user query facility according to the skill of the user.

The product is called Informatics, and at present is working on an eight-bit Intel microcomputer which links with mainframes to do a variety of jobs including terminal emulation. The software techniques developed in Informatics will be adapted to the IBM PC. Informatics is waiting for IBM

to fulfil its statement of intent to provide full 3270 emulation for the Personal Computer but in the meantime work is proceeding on the syntax for the end user.

"We see the Personal Computer as the way for the market to go," said Ian Durrell, who is the new general manager of Informatics' European operations for the software products group. "It fits in with the concept of providing an information centre which can act as a programmer's workbench."

Informatics' plan is to turn the PC into a tool which can be as useful to the unskilled end-user making queries as to the experienced programmer wanting full mainframe facilities. Users should be able to fetch data from remote mainframes or execute programs written on the PC wherever the relevant data may be.

The IBM Personal Computer is being groomed for a role in the electronic office when it reaches



BAUER... "We will have the marketplace to ourselves."

the UK later this year.

Peachtree, whose financial software was picked by IBM for the Personal Computer, is hoping that its office software will also win the IBM logo.

The software includes word processing, spreadsheet calcu-

lation, mailing and telecommunications packages sold in the UK as the Magic range. The latest release, Magic Messenger, otherwise known as Peachtree Telecommunications, cracks the problem of CP/M to CP/M communications via a modem.

## SERC to get first Atlas 10

by Maggie McLanigan  
THE Science and Engineering Research Council (SERC) is to be the first user of ICL's IBM-compatible Atlas 10 machine.

Announced six weeks ago, the Atlas is ICL's first collaborative venture with Fujitsu, and the Model 10 is the Fujitsu 380, with a 15 mips rating and 16 megabytes of main store.

SERC has placed an order for one of the £4 million machines to be installed at its Rutherford Laboratory in Oxfordshire, where it will work alongside the existing IBM 370/195 and an IBM 3032 front-end processor.

"The Atlas will be used to take part of the burden off the 195, in providing a service covering all types of science, particularly nuclear physics, to over 1,000 registered users from British academic organisations," said Brian Oakley, secretary of SERC.

This is not the first ICL equipment that SERC has bought, having invested in about 80 Perq intelligent workstations, and an ICL 2960 mainframe which will be used to control the Intra Red Astral Satellite (IRAS), a joint project with Holland and the US, which is launched next year.

"We expect the Perq terminals to be linked into the Atlas machine," said Oakley. "This will expand the laboratory's already large network, which covers most of the universities in the country."

The machine is due to be installed in May 1983, and this announcement leads to speculation that the other order hinted at by ICL at the launch of the Atlas range in May may also be confirmed soon.

## EEC aid to Silicon Glen

THE Scottish information technology industry this year had a £1 million boost from the European Community.

EEC grants announced last week included cash for "Silicon Glen" in the form of money for the chip factory of US-owned General Instruments, for Rodime of Kirkcaldy, the computer peripheral maker, and for Fortron's Dunfermline plant, which makes electronic banking equipment.

The EEC cash for Scotland was part of a £79 million package.



## Dealers signed up for UK launch

by Boris Sedaeca  
IBM is signing up UK dealers for its Personal Computer.

There are firm indications that the IBM Personal Computer will be launched in the UK first this summer and the machine is expected to get its first official European showing at the Sibex exhibition to be held in September in Paris.

Dealers are tight-lipped about the whole affair. Comart marketing director John Lamb was reluctant to comment on his company's discussions with IBM other than to say that it had expressed to IBM its interest in stocking the machine.

"I doubt whether anyone has been signed up yet," he said. The European operation of the giant US computer chain will almost certainly stock the machine. Its president, James Minotto, is currently negotiating franchise agreements with the intention of opening two UK stores soon.

"Our Computerland stores in the US and Canada sell a lot of IBM Personal Computers. It is a good product and highly professional. One of our franchisees in Boston does not even bother trying to sell other micros because he knows the IBM machine so well," said Minotto.

He added: "IBM runs a six-day training course for the machine - something you do not get with other micro manufacturers like Apple. We integrate this within our own three-week training course, which we run once a month now that we are opening stores at the rate of eight to ten a month in Europe."

Minotto plans to open 40 Computerland stores in Europe by the end of the year including the two in the UK. Central purchasing and distribution is based in Luxembourg and Minotto claims to be able to offer an order turnaround time of 24 hours.

Although Computerland in the US will terminate its purchasing

agreement with Apple in July, this will not affect the European operation which has a separate agreement with Apple Europe.

Computerland Europe was first set up in December 1978 by Gordon Starr and currently has 17 shops, seven of which are in France. Computerland France operates as a separate subsidiary from Computerland Europe because of exchange control regulations. Minotto took over Computerland Europe in July and plans eventually to hand over the French company to a Frenchman.

He emphasised that Computerland never had any dealings with Microcomputerland.

Microcomputerland director Norman Park has responded angrily to Microland's assertion that he had approached them for IBM Personal Computers. "We have delivered eight machines which we sold for £2,213, so what would I want to buy them from Microland at £2,450 for?" he said.

## IBM in satellite share talks

by Kevin Pearson  
IBM could have a share of two different satellite services in the UK by 1986 if talks with British Telecom and British Aerospace reach fruition. The company is already involved with Satellite Business Systems, which plans to introduce a satellite service to the UK later this year.

The UK negotiations, which also involve GEC Marconi, concern the provision of a multi-

purpose data communications service directly between customers in the UK and to the US and Canada. It would be carried by Unisat, which is due into orbit in 1986.

IBM's other satellite operation, SBS, of which it is one of the principal shareholders, plans to launch its own service to the UK and to Canada later this year using Intelsat's transatlantic satellite for data transmissions at up to 56 Kbits a second.

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## UK plans for Cobol clear a major hurdle

by Claire Gooding  
A UK proposal to streamline Cobol, the world's most widely used computer language, has cleared the major hurdle to acceptance, after seven-year battle.

Codasyl (Conference on Data Systems Languages), the US-based group which is the world's main technical arbiter on commercial computer languages, has agreed on specifications for a "Validate" verb. Designed to eliminate tedious data validation methods of current Cobol, it is already in use in UK installations such as British Gas.

"Unlike some things implemented by Codasyl, Validate is a high level facility," said John Triance, former chairman of the BCS Cobol Specialist Group. "It is talking to the DP man in his own language. We like to think it's the way the language is going."

"Without the BCS effort nothing would have happened. I must admit I didn't think it would make it because of the sheer size of the proposal."

Cobol standards are strictly controlled, and the proposals have had to pass through as many stages

as a Parliamentary Bill before final approval.

Now that Codasyl has agreed on a detailed specification of the Validate verb, it is likely that the Ansi standards authority will agree to "rubber stamp" the changes. It is now up to individual manufacturers to implement the Validate verb in their Cobol compilers along the lines established by Codasyl.

The British Computer Society started the Validate ball rolling some years ago. The idea was to do away with the clumsy validation processes by putting all data specifications into the Data Division.

Instead of validating each input, which can involve hundreds of lines of repetitive coding, the programmer can refer to the information coded in the Data Division. One instruction in the Procedure Division, "VALIDATE", refers back to the specifications and automatically checks the validity of the item.

This puts the effort of coding into the Data Division rather than the Procedure Division, a development which is not only economical, but fits in with the trend

towards using Data Dictionaries.

Codasyl approved the idea in principle over a year ago after rejecting it in 1975. But it did not vote to approve the detailed specification until its latest meeting in May. The complex proposals were passed almost unanimously, keeping close to the original British proposals.

Validate will now be written into Codasyl's Journal of Development, the master source of all Cobol development, and may even appear in the next Ansi standard, already under preparation.

"It's a fantastic achievement for a proposal of this size and complexity - it is by far the largest language proposal ever to get past," said John Piggott of S-PC, who chaired the BCS Cobol working party on the Validate proposals.

Piggott maintains that the changes Cobol is undergoing will keep it as the top DP language of the Eighties. "The next step is to implement screen-handling facilities. In a year's time we'll be seeing proposals which go much further than simply handling transactions, changes which deal with all facets of VDU."

## Ford looks for 3,000 development systems

by Claire Gooding  
ONE of the biggest software contracts in the commercial world is up for grabs as US car manufacturer Ford seeks over 3,000 new development systems.

Ford plans to introduce op-to-date in-house development software at its headquarters in Dearborn, Michigan, and reportedly has up to \$50 million to spend on the scheme.

There is speculation that it will plump for a system based on Unix, the operating system which has already been adopted from Western Electric by a number of manufacturers in the 16- and 32-bit micro and mini market.

The car manufacturer has been studying its requirements for some years, and has put out a detailed tender for a system which will support software development as well as executive workstations throughout the headquarters.

It is thought that over 3,000 units will be needed for the job. A Unix-based system is favourite for the contract because of its flexibility.

The name at the top of the list to win the contract is Fortune Systems, say industry observers in the US. The Fortune machine was introduced late last year and caused a sensation in the already crowded mini/micro market.

The system is based on the powerful and long-awaited Motorola 68000 chip, and Fortune had spent a lot of money in creating an end-user harness for Unix. The operating system is a good programming tool, but lacks applications and user interfaces, two deficiencies which Fortune claims to have put right.

"We know that Ford looks favourably on our system," said Fortune Systems president Gary Freedman.

## Xerox acts on lagging micro sales

by Howard Karten  
XEROX last week took steps to correct lagging sales of its Xerox 820 microcomputer, introduced a year ago. Sales of the 820 are soft and have caused concern at Xerox's office products headquarters in Dallas.

UK sales are said by Xerox to be "going as well as expected", but they are understood to be sagging here too.

Xerox last week announced the Xerox 820-11 in the UK, for delivery in August. It is said to have twice the computing speed of the original machine and four times as much disc storage capacity. The much-discussed Xerox 850 word processing system from its product roster, but plans to build about 3,000 more systems to meet current commitments.

The 820-II is being targeted at business and professional users.



TRIANCE... "It's talking to the DP man in his own language."

## Inmos may ask for £10m more

by Robert Parry  
BRITAIN'S state-backed semiconductor company Inmos will probably need an extra £5 million to £10 million next year.

Inmos remains silent on the level of finance it will be looking for, but the National Enterprise Board - through which the company has received nearly £100 million of State aid in grants and loans - expects it to need a "little more money" as working capital to enable it to reach profitability.

The NEB, which is now part of the Privy Counsellors' need for extra money is a problem of growth and success, not of failure, and that the gap to be bridged might well disappear anyway.

Both Inmos and the NEB have already said that Inmos will need further finance some time, but the amount, and the method and timing of raising it, have been kept well shrouded.

The money for next year ideally



WOOD... Ready to recommend government to provide the funds.

## NEWS BRIEF

### ICL unions set to accept pay offer

ICL's unions look set to accept the company's pay offer - but only until the end of the year.

Votes were still being counted as we went to press, but Tim Webb of white collar union ASTMS said: "Based on the initial returns the offer is likely to be accepted. But we will be back at the negotiating table at the end of the year, when we know the profit figures."

### Super centre

CONTROL Data has opened what it claims is the world's most powerful commercial computing centre in Minneapolis. Accessible from the UK via satellite links in CDC's Cybernet network, the centre contains nine large-scale computers, enabling users to solve problems that are impractical for conventional installations.

### \$5,000 fellowship

UK computer history graduates could take in \$5,000 plus expenses courtesy of computer pioneer Charles Babbage. The University of Minnesota's Charles Babbage Institute for the History of Information Processing is offering its fifth annual fellowship, to be taken at any appropriate institution. The address of The Institute is 104 Walter Library, 117 Pessant Street, SE, Minneapolis, Minnesota.

### Logica study

LOGICA is to continue the £2 million work it did for the European telecommunications authorities under the Eurodata 79 study contract. It is making a multi-client study of the information technology markets in Western Europe for a group of UK, Continental and American companies.

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# 5,000 visitors turn out for New York show

THERE was something for everyone at the Videotex 82 conference held in New York last week, as some 5,000 visitors - in states ranging from moderate to extreme enthusiasm - turned out to view more than 50 exhibits and listen to nearly 100 papers.

The papers ranged from such abstract topics as "Computer networking for Bildschirmtext" to such practical ones as Oracle Teletext's Humphrey Metzgen speaking on "Making money from Teletext".

This year's event was well-attended, and conference organisers were clearly pleased with the turnout.

The meeting, with more than 2,000 square metres of exhibition space, clearly eclipsed last year's to the delight, and sometimes consternation, of the hurried exhibition and registration personnel.

Among the British firms represented were BVT, Mullard, On-

line Conferences, Rediffusion, and Computex Systems.

IBM took over an entire room to present the offerings of IBM in different countries, and the IBM suite was well-attended, no doubt stimulated in part by its recent product announcements.

An interesting contrast could be seen in another room holding several Japanese companies which were demonstrating products and services available through Captain, the Japanese videotext effort.

Possibly in the wake of the IBM spying affair, the suite drew relatively few visitors.

Making money via the use of videotext and teletext seemed to be number one topic in the minds of many attendees. Several speakers explored the possibilities of using advertising in conjunction with videotext and teletext, and discussed their research to date.

The corporate logo for videotext and videotext participants might

well be the question mark, observed Gary Arien, publisher of a videotext newsletter, since there were still so many unanswered questions.

That theme was reiterated at a Press conference. Addressing a group of domestic and foreign journalists, John Butcher MP, Under-Secretary of State for Industry, pointed out that although television was actually invented and first transmitted in Scotland, "it took the Americans to turn it to effective (ie profit-making) use. I hope that happy partnership can be evoked again."

Butcher also noted that "this conference is about people making money - suppliers, information providers, system operators." He went on to cite growth statistics on Prestel - growth in the number of installed sets, in the number of information providers, the number of frames available, and so on.

Butcher also noted that "this conference is about people making money - suppliers, information providers, system operators." He went on to cite growth statistics on Prestel - growth in the number of installed sets, in the number of information providers, the number of frames available, and so on.



BUTCHER... "This conference is about people making money."

## No room for emotion on viewdata systems

UK firms were well represented at Videotex 82, both in the exhibits section and as speakers.

Roy Vivian, principal engineer in the automation and control section of the experimental development department of the Independent Broadcasting Authority, noted that the IBA booth had attracted so much attention that it was on the point of running out of literature.

Indeed, IBA's Level Four teletext display stopped many passers-by, but Vivian said he doubted whether Level Five teletext would prove practical in terrestrial transmission.

At a conference session exploring advertising as a money-making venture, Alan Wolfe, marketing services director for advertising firm Ogilvy and Mather of

London, echoed a common theme with his observation that teletext seemed to be particularly well suited for use as a mass consumer medium, while videotext was increasingly seen as a business-to-business medium.

In an observation remarkably candid for an advertising insider, Wolfe noted that "Gimmicky graphics seem less important than information - you can't effectively run 'emotional' material on videotext."

In another session Arnold Reymen, president of marketing research consultants Reymen and Gerain Associates of Southfield, Michigan, noted that potential videotext users seemed receptive to the idea of ads and shipping guides embedded in videotext.

## Network interface and gateway feature in spate of announcements

VIDEOTEX 82 was the scene for a spate of announcements relating to studies and products.

AT&T launched a Frame Creation Terminal intended for use by system operators or information providers in entering information or modifying existing frames. The \$34,000 device consists of a control unit, colour monitor, keyboard, and graphics tablet, and can display more than 65,000 shades.

The unit is currently being marketed in Florida, and Videodata Corp of America, a subsidiary of Knight Ridder Newspapers, will be the first customer. The FCT will later be offered by American Bell, the newly named, unregulated arm of AT&T.

AT&T also announced the availability of specifications for two interfaces to a Bell system network currently in the planning stages. The network, now being called Local Area Data Transport (LADT), would provide packet switching services at speeds ranging from 9.6 Kbps to 56 Kbps. It is expected to be introduced between 1983 and 1985, subject to political and regulatory approval, and would provide packet switching data transport accessible through the public switched network.

CCG, the computer communications group of the Trans-Canada telephone system, announced that it would begin a one-year field trial of its iNet gateway concept. The trial, due for launch on July 12,

will place 250 Telidon terminals and 150 standard alphanumeric terminals in businesses and some consumer environments throughout Canada.

The iNet gateway is described as a "single point of access to simplify gathering, using and communicating information for users."

Ayr Viewdata of Surrey announced that it had introduced its range of Prestel and Teletext set-top decoders to the US market. Systemhouse of Ottawa, Ontario, a major Canadian consultancy, announced the availability of videotext software for the Hewlett-Packard HP3000 computer. The Systemhouse software is compatible with AT&T's proposed PLP standard, according to a spokesman.

## COMDEX SPRING 1982

# Sweet smell of success for transatlantic ZX81

TS1000. A million units will have been shipped worldwide by the end of this year and it would be more easily recognised in the UK under its original name as the Sinclair ZX81.

In its transatlantic version the T stands for Timex and the S for Sinclair.

Since its launch in Chicago early this year the demand has been enormous according to the Timex stand staff at Comdex Spring 1982, in Atlantic City. One of these said: "Supplies are going to be the problem." But this will not be a new difficulty for Sinclair and Timex.

Sinclair's new machine, Spectrum, is not yet available in the US but "Timex cannot wait to get its hands on them."

IBM had brought its prototype flat screen plasma display to see if

in walking past the stand, let alone trying to actually see the device, interest was reasonable. The device itself was an elegant piece of hardware, with a screen 13 inches by 10, and will be available in any colour you like as long as it's orange, should it go into production.

The IBM stand was one of the few not to have the IBM Personal Computer on display. Latest rumour on the PC British launch is this autumn.

Adam Osborne, the power behind the Osborne 1 portable computer, announced at his Press conference at Caesars Palace, an agreement with Softech Microsystems of San Diego to supply the UCSD P-system operating system free with each Osborne machine sold.

"I've moved away CP/M with each VisiCalc because they were developing into industry standards, not because they were the best," said Osborne.

"IBM taught us that you don't have to be the best to succeed; you don't even have to be good."

"CP/M is an adequate operating system, but we must go with Pascal, and any program written on a p-code machine can be run on any other p-code machine. P-system has a standard diskette format, and it's the first step towards an industry standard."

Asked when the large-screen Osborne would become available, he observed that most of the complaints on the screen size come from people who don't actually own one of his machines. "There's an upgrade coming in early September."



OSBORNE... "IBM taught us that you don't have to be best to succeed."

P-system also found favour with several other luminaries at Comdex. Portia Isaacson, president of Texas-based Future Computing, went as far as to say "The last

thing you want on a microprocessor is a microcomputer-type shared processor operating system like Unix - p-system wins every time."

## SALES BRIEF

### Cranfield first for VAX-11/782

DIGITAL EQUIPMENT CORP. has announced the sale of a VAX-11/782, which consists of two tightly coupled 11/780s and an MA780 disk memory subsystem, has gone to Cranfield Institute of Technology. It will be used for computer-aided design and engineering work including finite element analysis.

The system will be linked to dual-ported disc and tape units to an existing 11/780 which has seen a 30-fold increase in usage since it was installed at the end of 1980.

### Power to Sigma

HORSHAM-BASED Sigma Electronic Systems has won a £160,000 order from the Central Electricity Generating Board for Sigma Series 7000 high-resolution colour graphics display controllers. The controllers will be used to develop display software for fault location systems in six pit control centres. Supplying the centres with controllers over the next three years could bring Sigma a total of over £1.5 million worth of orders. Each centre is to have about 20 displays.

### Brown Box

CITIBANK has ordered three of Brown's Box Model 3299 terminal cluster controllers from Blackheath-based Brown's Operating System Services. The controllers will be used to handle up to seven dial-in calls at a time from a wide variety of types of terminal to customers' offices to Citibank's IBM mainframes. The bank will now have a total of 37 Brown's Boxes in branches including Tokyo, Madrid and Puerto Rico.

### Printer deal

ANADIX has won a £100,000 order for its DP-9501 200 character per second impact matrix printer from graphics systems supplier Westward, which plans to sell them with its display terminals as graphics workstations.

## SOFTWARE BRIEF

### Colour graphics for Apples

LEADING Apple supplier Personal Computers is to sell colour graphics software and a high definition plotter to interface with the Apple micros. Priced at £75, the PPS Graph software generates line, bar and pie graphs. The Hewlett-Packard HP 9470 plotter, which costs £999, gives a choice of 10 colours and uses two pens simultaneously.

### Air freight system

REVENUE control and cost information for air freight companies is offered with the Airpak system developed by Freight Computer Services, a subsidiary of the National Freight Consortium. Designed on a "building block" concept to be flexible to all sizes of company, Airpak costs from £20,000 and runs on Honeywell Level 6 minicomputers, under the GCOS MOD 400 operating system.

### Motor trade aid

BUREAU Automatic Data Processing has launched an order entry system aimed at dealers in the motor, agricultural machinery and factoring trades. Called ADP On-line, it has already been available in the US for nine years, and links parts stock control with comprehensive accounting facilities to provide an order entry and point of sale invoicing system. It costs around £145 per week to run.

### APL courses

INTERNATIONAL time sharing bureau I. P. Sharp Associates is holding courses in the use of APL around the UK throughout July. Venues include London, Bristol, Coventry, and Aberdeen. Courses cost between £75 and £250 depending on subject and duration. For further information, contact Margaret Joachim, I. P. Sharp Associates, 132 Buckingham Palace Road, London SW1.

### For estate agents

AN estate agent's system has been designed by Business and Administration Systems of Borehamwood, Herts. Written in Pascal to run under CP/M or MP/M on the Rair Black Box micro range, it includes word processing facilities and gives full details on the current position of any property or application.

### Omnix milkman

TAPPING the milk market, Computer Automation has appointed Worcester-based Orchard Data as an Omnix franchisee to penetrate the retail milk delivery trade. Orchard Data has developed the Roundman package to run on CA's Naked Mini range, which is compatible with Omnix. The Roundman handles up to 50 rounds per day and costs about £10,000 inclusive of hardware and software.

### Personnel admin

BRISTOL based United Personnel Services has launched the System 90 personnel administration package. It is timed to be available to comply with new Employee Statutory Sick Pay (BSSP) legislation, effective April 1983. Written for Texas Instruments' range of mini and micros, System 90 is a development of the System 80 personnel administration software, and can be tailored to fit individual needs.

### Learning CP/M

A HANDS-ON self-instruction package for the CP/M operating system has been announced by Heathkit/Zenith Educational Systems, a division of Heath Electronics.

## SOFTWARE FILE

# 'The industry is under-selling itself'-BIS chief

by Kevan Pearson

IBM has a lot to teach the software industry about selling their products, Roger Graham, managing director of BIS, told a specialist group at the World Computer Services Industry Congress in Copenhagen at the end of last month.

"Software manufacturers have to understand what IBM understands about this business, that the marginal cost of the product is under 20% of the total cost, the rest is marketing, distribution, support, maintenance and profit."

"We are under-selling ourselves. The future of the industry lies in spending more money and effort on marketing its products," Graham said.

His arguments are a direct rebuttal of the position taken by Philippe Dreyfus, vice-chairman of Cap-Gemini-Sogefi, who told the congress that the future of the software industry lies in applying more resources to programming

and systems analysis, and less to marketing and selling.

Graham also said that most of the growth in the software market in the future will be in providing packages for specialised industry applications, and not in the mass market packages like payroll systems and other financial packages. "Packages will become much more 'industry specific'," he said.

Another significant change will be the growth of "software OEMs", companies which take the products of another software house and add value to these products to sell either to end users or to other manufacturers. We have already seen this kind of thing in the micro software market, said Graham.

One of the notable examples is the micro-based relational database system MBDS 3, which is being used by a number of British micro software companies both as



GRAHAM... IBM understands the software business.

a development tool and as an integral part of their own products. In terms of the international market, Graham said that overseas expansion is best achieved by set-

ting up a directly owned subsidiary, or a agency. Distributorships are only suitable for micro software costing less than \$5,000.

## Emulator replaces DRS 20

A PACKAGE from MAP Computer Systems may undercut ICL's sales of DRS 20 terminals by offering a cheaper link with mainframes.

Oldham-based MAP has developed an emulator for ICL's CO2 mainframe protocol that allows any microcomputer running under the CP/M operating system to be linked with ICL's 1900 and 2900 range of machines as a 7502 intelligent terminal. Although ICL is gradually phasing out the 7502a, it intended them to be replaced by its own DRS series, and MAP now offers ICL users a far cheaper alternative.

There are emulators for ICL protocols already available on the market, but these are usually in the form of a board that slots into the back of the micro, and the user has to buy a specific make of computer as part of the package. MAP's emulator offers users the chance to connect an existing machine into the mainframe for about £1,000, including installation assistance and support.



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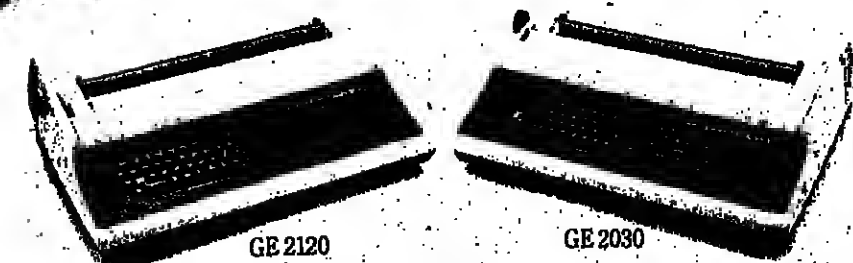
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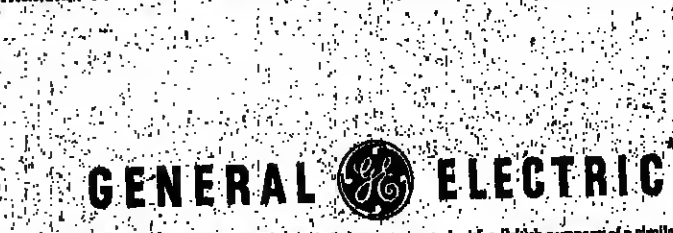
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# Inmos 64K memories set for mass market

BRITAIN'S mass market microelectronics bope Inmos last week officially launched its entry to the burgeoning 64K memory market. Chips have already been sampled by major customers, but they are now to become more widely available.

Distributors Hawke Electronics and Rapid Recall should have stocks on their shelves in August or September, says Inmos European marketing director David Sherwood. By then customers should be ready to order in quantity after their initial assessments and device qualification.

The 64K dynamic RAM market, put at 220 million units for 1983 by Sherwood, is still dominated by the Japanese manufacturer, with several companies turning out more than a million units a month. Inmos has more modest aims for the time being: It reckons to ship hundreds of thousands of parts this year and millions next.

Production of the 64K dRAMs initially will be from the US plant

in Colorado Springs, but the company intends to put the devices through its UK factory at Newport, Gwent. Backed by the UK government to the tune of £50 million, and with as much again in loan guarantees and development grants, Inmos is likely to need an extra £5 million to £10 million working capital during the next year to reach profitability.

The Inmos chip is up at the fast end of the speed range for 64K dRAMs. It comes in 100 ns and 120 ns access time versions, putting it ahead of the bulk of the parts from the dominant Japanese manufacturers.

But the performance carries a price premium. The Inmos chips will sell for £17 and £13 in 100 quantities, compared to a typical £5 for 150 ns parts from Japanese mass producers.

One way to increase the speed of moving data on and off the memory chip without having to beef up the performance of the chip so much is to raise the number of bits of data supplied at

one time. Texas Instruments has just done this with its TMS4416 chip, which has 64K bits organised as 16K by four.

The chip is based on TI's current 64K offering, but outputs four bits at a time. This gives it four times the bandwidth — the number of bits available in one cycle time — of the earlier 64K-by-one-bit chips, and so has an increased data rate.

TI reckons that such memory chips will find applications in high resolution graphics systems, providing the memory requirements at a lower cost per bit and power consumption than fast static RAMs or 64K by one bit and 16K dynamics.

The other main benefit of adopting the 16K by four bits organisation is a reduction in the minimum amount of memory that can be added to a system in one go.

For eight-bit systems, eight chips are needed when organised as single bits, which means a minimum increment of 64 Kbytes when using the current crop of



Furnaces at Inmos' Newport factory. Wafer lines are now running test chips and will be producing 64K dRAMs by the end of the year.

64K dRAMs. With the 16K by four organisation this drops to 16 Kbytes, and needs only two chips to implement.

Inmos will be bringing out a 16K by four bits device towards

the end of this year, with volume shipments early in 1983. An 8K by eight bits chip will follow.

Both NEC and Hitachi plan to more than double their production capacity to over two million units a

month by early 1983 to meet the increasing demand for large-scale contracts for 64K dRAMs from European and US computer and telecommunications manufacturers.

by Robert Parry

## COMPANY NEWS Massive share-out as GEC comes up with record results

by Kevan Pearson  
BRITAIN'S electronics industry continues to shine. After a record year, General Electric is paying a massive 15p a share in dividends, reflecting a 50% increase in its cash holdings.

GEC's pre-tax profits rose by 23% to £584 million, while sales increased to £4.2 billion, a rise of 21% compared with the previous year.

The most prodigious rise is seen in GEC's massive cash balance which at year-end stood at over £1 billion, a rise of £375 million.

While speculation will naturally increase that GEC will be on the acquisition trail, the company has not been too active on this front in the UK. Most of its takeover activity has been in the US — and has not been particularly successful.

Nevertheless, the company's performance last year was enough to make it the highest valued company on the London Stock Exchange after the result was announced, overtaking BP.

On a current cost basis, allowing for inflation pre-tax profits rose by 30% to £468 million, from £360 million a year ago.

A detailed breakdown of the result shows that sales of electronics and telecommunications equipment jumped 15% to £1.4 billion. Profits from this division leapt 31% to £210 million. But sales of computers are said to be below expectations.

More impressive was the company's overseas performance, where sales rose by a massive 67% to £1.3 billion. Overseas earnings are in second place in GEC's earnings table, behind electronics and telecommunications.

As to who, if anyone, GEC would bid for, there is much speculation, but little hard fact. GEC's chairman, Lord Weinstock, has indicated a willingness to get involved in West Germany with the troubled AEG Telefunken, with talk of a 40% stake in a new technical venture. However, the AEG workforce is objecting,



WEINSTOCK... Willing to get involved with AEG Telefunken.

which has led the company's directors to seek aid from the West German government.

On the British front, GEC is continually linked with Ferranti. Ferranti had an excellent year in 1981, and its shares are now marketable after a two-year delay. But a bid for Ferranti looks extremely remote for several reasons.

GEC's corporate image is unlikely to sit well at Ferranti, whose directors would almost certainly resist such a bid. And there might be objections from the Office of Fair Trading on monopoly grounds. Finally, following a successful year, Ferranti's valuation is riding high.

## NEB failures milk taxpayer once again

FINANCING the future is a perilous task. The National Enterprise Board has learned that politics — the art of pleasing people in the future, and business — the art of pleasing them now, make an uneasy mix.

Last week the NEB announced losses for the year ended December 31 of £56.24 million.

For the taxpayer the balance sheet is grim. The revival of the "white heat of technology" theory cost us all a straight £40 million plus a few odds and bobs. That was the cost of the ill-fated "Grecks", Inscac and Nexos.

Nexos Office Systems cost £34 million to dispose of. Inscac Group cost £6.86 million to dispose of.

On the plus side Case brought in £1.22 million and various other publicly supported companies

culled another few hundred thousand.

And DRI, the NEB-backed peripherals company, is now trading at a profit.

For the future Systeme, an associated company, is well on stream with its cash flow and profit as well as its BBC-supported £30 million project for manufacturing plant and headquarters. Inmos, as reported on other pages, will require another £5 to £10 million to bring its 64K RAM into full production.

To lose £56.24 million is no ordinary task. But the majority of it was dumped on two companies — both of them good ideas and both of them badly executed.

One was Inscac — born of the days when we believed that the Americans would buy anything. It was designed to sell British software in the US. Before it died it had only one UK product, and was talking about selling the remainder, European in origin, to the Europeans.

The second was Nexos — born of the idea that the office revolution was upon us and that the UK had — as it does — most of the best skills for dealing with the technology.

But the revolution will occur only when the mass of people change their habits of work. The result in Microwerks terms is too much money lost too soon.

The project was sold off for a loss of over £5 million. But the BTG still has an interest in it — success — for Logica, the systems house which developed part of the software, is partly owned by the public body and should do well.

## All Change coins call box market

VENTURE capitalists with cautious eyes for would-be recipients of their cash can derive reassurance from the outstanding success of Chapman Cash Processing. Less than a year ago Computer Weekly had received £250,000 from Venture Founders Capital to get off the ground.

Last week British Telecom inaugurated with considerable pride and fanfare a coinbox management system called All Change, based on complex and innovative hardware and software developed by CCP in less than six months.

"British Telecom needed the software developed in the five months leading up to April 1, a deadline which was not movable," said founder and managing director Colin Chapman.

The All Change system closely monitors London's 11,000 public telephone kiosks to "substantially reduce" the number out of order because of overfull coinboxes — about 400 a day until now.

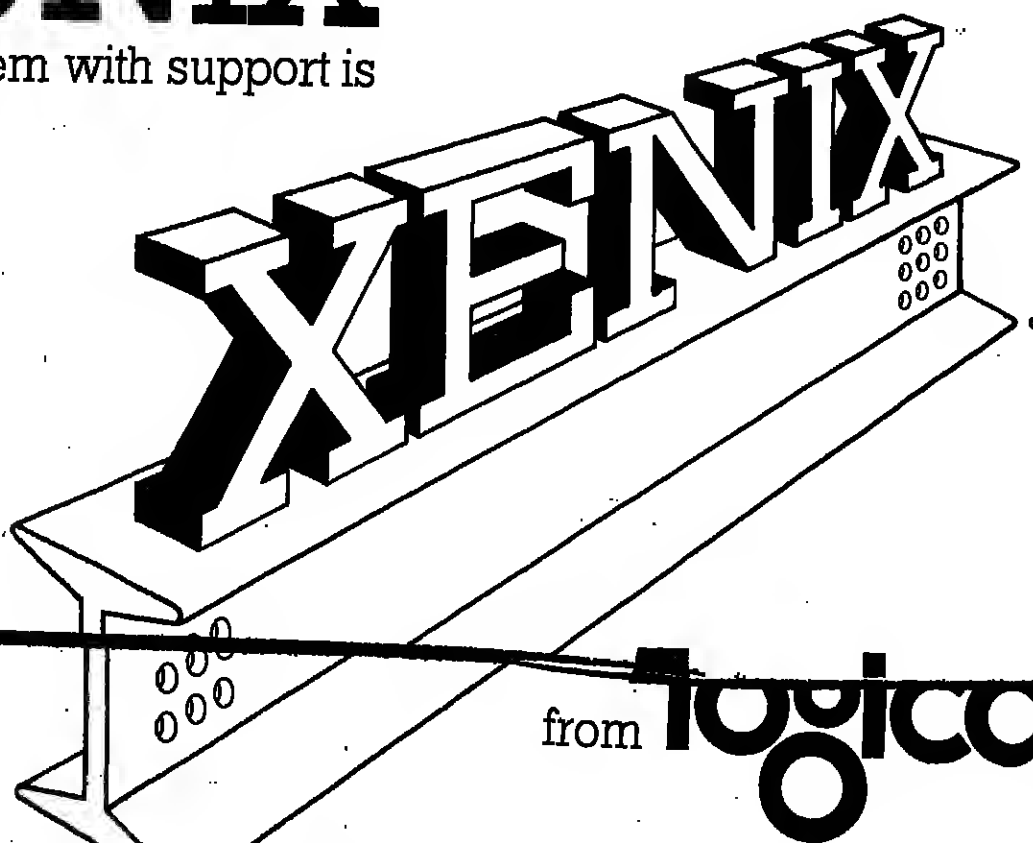
Another aim is to speed up the reporting of jammed, dirty or vandalised equipment.

The heart of the system supplied by CCP is a dual processor minicomputer configuration at BT's coin counting centre in West London. The two Computer Automation LSI 4-30 machines host applications software written largely in Fortran IV and running under Computer Automation's RTX real time executive.

One machine collects data on-line from the 12 coin counting stations installed at the centre. It maintains a kiosk status database and works out when each box should be emptied based on the last six emptying intervals. The other machine transmits kiosk status information to terminals at 12 local BT offices in the London area.

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## Plug-in card duplicates 'uncopyable' discs

THE battle between software protection systems and disc copiers for program back-up is boiling up again.

A plug-in card for Apple IIs has been developed by Robert Sather of Dark Star Systems in Greenford, Middlesex, which can copy even the best protected programs, as long as they reside entirely in the Apple's 48K of RAM.

So far the disc protectors have been winning, with several "uncopyable" discs appearing that best the bit-copying programs like Locksmith and Back-Up. But Sather claims his Snapshot device will beat these, giving back-up copies of even the bit-copying programs themselves — the best protected micro software around, in his view.

The key to Snapshot's success is that it does not try to copy the protected disc, as the bit-copyers do, but dumps memory contents to an unprotected back-up disc. To use the device, the Apple must have the Apple language card or Microsoft or Compuserve RAM cards in place.

The Snapshot board plugs into the RAM card and is connected to the RAM card by a ribbon cable.

The Snapshot back-up disc — itself unprotected — is booted, as is the program to be copied. Snapshot can interrupt a running program at any point, when it dumps the contents of memory

and registers to the back-up disc. As long as the program resides entirely in the 48K RAM, there will then be a full back-up copy of the program on the disc.

When the back-up disc is booted, it restores the contents of RAM and resumes executing the program where it was interrupted. This facility makes it a useful tool for debugging and analysing programs too, says Sather.

Snapshot can examine, modify, disassemble, step and trace an interrupted program repeatedly, starting it from the point of interruption each time.

Sather developed Snapshot after he acquired an Apple a year ago and became interested in looking at other operating software. He also found that protection mechanisms on programs like VisiCalc and releases of VisiCalc — and the bit-copyers — were becoming very sophisticated.

"You may need hours or days fiddling with parameters and playing trial and error to copy them with the bit-copyers," says Sather. "Snapshot copies them all with the same straightforward procedure; to unprotected disc, in under a minute."

Programs it cannot copy are those, like some large Adventure games and accounting packages, which use overlays and repeatedly refer back to their own source discs.

## Positron to enter small business market in UK

MERSEYSIDE micro manufacturer Positron Computers is to spread its wings into the small business systems market.

It has signed up Shaw Business Centres of Bolton to distribute the Positron 9000 microcomputer nationally, and is exploring distribution possibilities in France and the US.

The machine has been available to the education market since the start of the year, distributed through Griffin and George, but is now set to go for the business market with a range of application software.

It can function as a standalone workstation, linking into public or private networks and interfacing to mainframes. It will also be available as a four-user system.

A Winchester hard disc option,

using a Seagate five Mbyte 5 1/4-inch drive has recently been added to the 6809-based machine.

The Positron 9000 was developed by two ex-IBM system engineers, Peter Loftus and Peter Plinston, with backing from the Anglo American Venture Fund.

Applications so far have included a CAD/CAM system being developed at the University of Bedford and a workstation to transcribe engineering drawings in machine tool tapes from Optics Logic of St Helens.

"We are now planning to make major inroads into the market share of the more established names like Apple, Per and Tandy," says Loftus.

But he emphasises that Positron will not be neglecting the small and process control sectors.

## Sperry, Amdahl in US air traffic control tie-up

by Howard Kerten  
SPERRY UNIVAC is teaming up with Amdahl in California in a bid that could be worth up to \$300 million. The bid, expected to be announced by the government in September, is for the replacement of the entire US Air Traffic Control (ATC) Enroute System.

This system consists of 22 installations, each with an IBM 360/65 Triplex configuration.

The ageing system is used to control aircraft in route between major airports or cities, and is

separate from the air traffic controllers at each major airport.

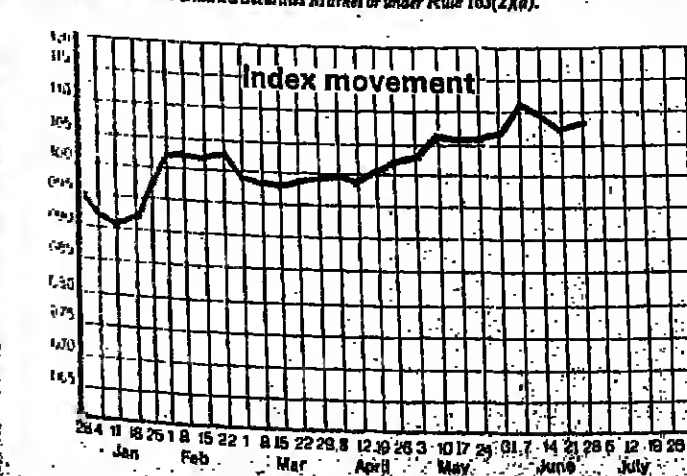
Sperry is teaming up with Amdahl because the bid requires 360 compatible computers. The General Services Administration, the procurement arm of the US government, recognises Amdahl as an approved vendor. But Amdahl does not have extensive experience in responding to tenders requiring extensive software modification, according to Sperry Univac.

Amdahl will in effect be a subcontractor with Sperry providing software support.

## CW SHARES TABLE

Price	London Stock Exchange	Price	Change	Price	Change	Price	Change
1982	1981	1982	1981	1982	1981	1982	1981
100	100	100	100	100	100	100	100
101	101	101	101	101	101	101	101
102	102	102	102	102	102	102	102
103	103	103	103	103	103	103	103
104	104	104	104	104	104	104	104
105	105	105	105	105	105	105	105
106	106	106	106	106	106	106	106
107	107	107	107	107	107	107	107
108	108	108	108	108	108	108	108
109	109	109	109	109	109	109	109
110	110	110	110	110	110	110	110
111	111	111	111	111	111	111	111
112	112	112	112	112	112	112	112
113	113	113	113	113	113	113	113
114	114	114	114	114	114	114	114
115	115	115	115	115	115	115	115
116	116	116	116	116	116	116	116
117	117	117	117	117	117	117	117
118	118	118	118	118	118	118	118
119	119	119	119	119	119	119	119
120	120	120	120	120	120	120	120

The table shows the closing prices on Thursday. The Share Index is based on the prices of the UK companies in the table. High and Low are shown where necessary.



The London Micro Centre of EMG, founder and 15% equity holder in the national network.

## BR Pension Fund puts £1/4m in micro network

by Kevan Pearson  
A SMALL British microcomputer company and management consultancy has pulled off a major coup in attracting investment from the UK's normally conservative pension funds.

British Rail Pension Fund once known for its purchases of fine art, has taken the plunge and put a £250,000 stake in a new venture to set up a national microcomputer network in the UK.

The venture is being set up by the Executive Management Group which already runs a several microcomputer centres, including one in London. The pension fund's stake represents 15% of the equity of the new venture, EMG

National Micro Centres. The remainder of the shares are owned by EMG.

Malcolm McPherson, one of the founders of EMG and its managing director, attributes EMG's investment to "a very convincing five-year plan" and to the backgrounds of the people at EMG, who moved into microcomputer retailing from accountancy and business consultancy.

He said the company aimed to use the money to finance an ambitious expansion plan to spread its microcomputer centres to all the major UK cities through directly owned subsidiaries, and through a franchise deal.

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# SYSTEMS THOUGHTS

## Prejudice against colour in computing

A FEW weeks ago I was fortunate enough to see a demonstration of the "SeeWhy" simulation system produced by BL Systems. A prominent feature is its use of moving colour graphics to represent the formation of queues and flow of transactions through typical systems under study, such as a supermarket or production line, for example.

Without the graphics this would have been just another simulation system, but the effective use of colour graphics made it possible for a user not very well versed in statistics and probability theory to interact with the model directly and answer "What if?" questions.

The demonstration reminded me of a fundamental question that has interested me for some time: the prevalence of monochrome VDUs in data processing applications.

Colour is such an important dimension in our perception and speed of learning, that it is curious to speculate why it is not more widely used in data processing applications such as online transaction processing. Granted the original reason was one of available technology and costs, but now that colour graphics are a standard feature of many cheap micros, this is no longer the dominant factor.

It is some time now since IBM announced colour VDUs, and other screen manufacturers also have colour available on their character VDUs, yet there still seems

to be comparatively little interest in making use of colour as a dimension of systems design for DP systems.

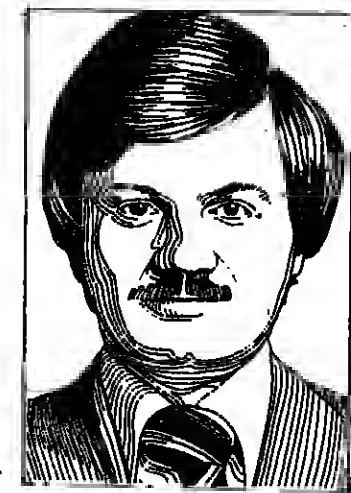
The complexity of programming is not an excuse and "fixed-format" screens can make use of attribute bytes to set colours in a similar way to making a field protected or double brilliance, for example.

The question is even more interesting when the widespread use of colour in clerical systems is considered. We all know multi-part forms where the pink copy goes to finance, the white to sales and so on. The colour is such a useful aspect of the information conveyed that it is surprising not to find it playing a similar part when these systems are computerised.

A certain amount of this may be attributed to technology "lag", though I cannot help feeling that the reason may be more fundamental.

Perhaps the way colour is used in a clerical system is less effective in the information it conveys than using any of the extra "dimensions" available on standard VDUs such as flashing fields or audible alarms, so there is no real need for colour when these systems are translated on to VDUs.

The use of colour in multi-part forms certainly does not usually contribute extra information to that printed or written on the form itself, but serves to assist the retrieval and distribution of the documents and also acts as a clerical



Norman Revell is a lecturer with the business systems analysis team at City University, London. He is a consultant with IBM and several other companies.

I doubt that there is much prejudice against colour on the part of the designers and programmers of online systems - as a group they constitute the heaviest users of coloured fluorescent pens that I know! Nor is the use of colour for text information on screens all that novel. Many of the games available on the domestic micros previously referred to make use of it, as do Prestel and other related systems.

To summarise: Are colour VDUs providing facilities that DP systems do not need and, by implication, clerical systems only use because of their inherent limitations or is the added dimension of colour something that we are not really exploiting in DP systems yet?

I would be interested in the views of readers via the CW correspondence columns - especially those using colour VDUs for on-line transaction processing applications.

Norman Revell

# HUMAN TOUCH

## Getting to know your data

LEAVING aside all the frills, improvements and variations there are just two basic ways in which data can be represented to a computer. When the data reaches a program, that program has to know what the data is in the sense of what processing is to be applied.

The program may know what the data is either implicitly or explicitly.

If the identity of the data is to be known implicitly, then this is much the same as saying that you have to know what the data is before you start. The data is identified by its position. That position may be characters 10-15 on line four of a particular screen, or following the sixth comma entered in a line of job control instructions. Do not be confused by the fact that a description of the data appears on the screen immediately before positions 10-15 on line four.

The program will not look at that description in order to know what data has been entered. The description is a constant provided by the program and in the very best systems can be altered by the user so that he can follow his own preferred descriptions of the data.

The knowledge of what a particular piece of data is, is implied by its position relative to other data (as in a list) or relative to some location (as on a screen or in a punched format). It is this implication that gives the name implicit to the method of data representation.

If the identity of the data is to be known explicitly then some entry has to be made that identifies the data that usually follows. A typical entry is SIZE - followed by the data. The program knows by this explicit entry of a name for the data what it is that follows.

The implicit method of identifying data is usually found when the same set of data items must be entered repeatedly. The explicit method is useful when a few items of data from a possibly large set have to be entered at the choice of a user.

Cliff Dillaway



Cliff Dillaway is an independent consultant specialising in accounting software, taxation and payroll.

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## 10 YEARS AGO

From Computer Weekly of July 6, 1972

THE provision of £14.2 million government support and a firm rejection of any idea of a takeover of ICL by US computer firms were the main points in a statement in the Commons by Industrial Development Minister Christopher Chataway. Financial support fell considerably short of the £50 million a year recommended by the Select Committee on Science and Technology.

# FOCUS

## Wanted - a guide to good buys

THERE has probably been a period in computing history when the potential user was somewhat in need of care, attention and advice. But while the demand for advice has increased, the supply has fallen to a point where it is nearly invisible.

Although users can get their first small computer from suppliers - their duty now is to make them adequately informed on the matters - positive "buy" recommendations are about as scarce as fully satisfied users.

It is not unknown for DP professionals to be asked - "pick over drinks at the local pub" or during the course of a dinner with friends - for the spot system recommendation. Giving such instant advice is a far from easy unless the system resembles a formal feasibility study.

Within the last two weeks, I have been asked to recommend, during a rare sunbathing session on Deal beach, a suitable machine which would serve the needs of a small reservation system. As an equally unfamiliar venue - 2 House of Commons Terrace - which micro would best suit MP's 12-year-old son. In both cases, recommendations were given for an agricultural bureau and a private investment club. I doubt such inquiries are representative of general levels of demand for the non-DP specialist.

All this uncertainty suggests that the computer community are failing to produce the goods. Considering the stream of articles published in an increasing number of journals on how to choose and select a computer system, the prevailing uncertainty is rather odd.

Advice ranges from specialist micro publications to professional magazines, seminars, office and company magazines to a comprehensive range of books and guides on the subject.

However, it does not seem to realise that all these books, articles lack one vital factor - a practical product recommendation. The published works are strong on evaluation matters as to computers do and how they do and how they will change the face of the office, home and factory of the future.

While the books present a basic data on recruitment, training and managing computer systems, they are notably short on hard facts recommendations. In case, the publishers' defence is that of timescales. Giving the publishing thumbs-up to an Apple Pet, for example, could be dated by the time the article appeared.

In any case, the computer professional is not alone in his equipment colleagues, it is relevant to propose best or worst lists. Comparisons are usually limited to machine ranges rather than competing equipment. That a micro has a tendency to overheat is left switched on for a long period of time, is subject to recent interference from passing cars within 1,000 feet is not compatible with any UK technology and data is a matter for user discovery.

The challenge of computing includes a considerable amount of it and find out yourself.

Meanwhile, many advertisements only serve to add confusion or bafflement to potential users. The specialist micro advert often assume their readers have an electronics degree while the traditional vendors believe it is more beneficial to sell large conservation and macro equipment than machine application. Special exhibitions and conferences similarly offer the potential for healthy rations of confusion.

Alan Simpson

# Computer Weekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, July 8, 1982

## How to react to the Japanese

THE biggest shakeout the computer industry has yet seen is coming as a direct result of Japanese proposals for a fifth generation computer project. This week in London the debate on the project will reach a new high in intensity as UK software house SPL International hosts a three-day conference which was set up in the shadow of the Japanese challenge (see story page 3).

The effect Japanese proposals have had on the computer industry's thinkers is well summarised by Stanford University's Edward Feigenbaum, one of the speakers at the conference: "The system outlined is discontinuous with traditional thinking but completely continuous with the vision of computer scientists over the years for a truly intelligent system. The project aims to build the artificial intelligence machine that we have all been waiting for".

This comment conveys the enthusiasm felt by many. It also makes the point that the fifth generation produced by the Japanese is simply a restatement of objectives pursued by many Western scientists for many years.

That point is important, and it needs to be stressed that the fifth generation is just a concept, not a reality. Japan's Ministry of International Trade and Industry has skillfully given an impression of something concrete by laying down a detailed timescale, and has ensured that the West takes notice by inviting us to collaborate in the development.

□ □ □ □

But when all is said and done, MITI has not done or even said anything new. A sober and accurate assessment of the report's significance is provided by another speaker, Newcastle University's Phil Treleaven: "Japan has pinpointed the front runners in special areas of research".

The widely held belief that Japan will inevitably in time dominate other industries, such as motor-cycles and radios, is very questionable. For one thing, it is doubtful whether the "vision of computer scientists over the years" can be translated into reality simply by the formulation of a plan, even over a 10-year timescale.

It is worth reminding ourselves that the Japanese have contributed precisely nothing to the architecture of the fourth generation. The mainframes produced by their computer companies are carbon copies of American systems. All they have done is to apply their undoubted engineering skills to the task of producing more cost-effective implementations of Western ideas and concepts.

□ □ □ □

If Japan is merely to retain its present position in the computer industry (as opposed to the components business), that situation cannot be allowed to continue. NEC's Michiyuki Veeohara puts it: "We can no longer rely on the US and Europe to perform the advanced research which we will need in the future".

That is the real motivation behind the production of Japan's fifth generation report. In order to avoid losing out when the West eventually produces its fifth generation (and the Japanese are well aware that all the concepts contained in their report are currently being worked on in Western laboratories), MITI has made a pre-emptive strike by formulating its own view and, most significantly, inviting the West to collaborate. That way they can be sure they won't be left behind.

And it is in that context that any response to the Japanese initiative should be formulated. The British government has, so far, taken a cautious view: after doing nothing for some months, it set up a study group in April, to examine the scope for collaborative research projects.

Industry should adopt a similar stance. There is no need to rush panicking into action to offset the imminent disaster of Japanese domination of the computer industry, because it's not going to happen. We should certainly consider collaboration when we can see something in it for us (as for example ICL has done), but we should never forget that we've actually got quite a lot to offer them.

## 1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by J. B. Lupton of Derby, who wins £5. Operated and supervised by one man, the complete system has its programs stored on floppy disc with paper tape backup. The machines are programmed in English.

# LETTERS

## Jobs for next generation IBM three-day briefing

I FOUND your feature on Office Automation contained more sound common sense than I have read on the subject for many months. In particular Philip Conford is correct in his assessment of Information Technology Year.

What so many organisations, including the government really need is the skill to identify unambiguously market requirements, whether the commercial profit or social gain, the clarity of thought to select from the vast amount of information already held, the willingness to make, and stick to, decisions which may be unpopular, and the honesty to review critically at predetermined points the effectiveness of their decision-making ability.

My personal view is that for the

good of the next generation our national priority should be to re-evaluate work distribution between the haves and have-nots.

Our present educational system - underwritten of course by the taxpayers, private and corporate - should not be influenced too greatly by the prophets of "information revolution". As a country we cannot afford to dissipate our efforts on techniques which at best merely pass on social costs to those sectors of the economy less able to support them.

It is no argument nowadays to say "But we haven't made employees redundant," what we need is reward for the creation of new jobs for the next generation.

Shenfield, Essex.

D. MORRIS

AN article (CW, June 10) alleges that IBM recently pre-announced a small business computer to "a select group of data processing managers in the United States who are large scale users" of IBM's System 34.

Had you taken the time to check the facts with us prior to publishing the story, you would have found out the following:

1. Our practice remains one of not commenting or speculating on future product announcements;
2. We have no record of a meeting such as you describe. A three-day briefing for data services companies in Florida during the first week of June included a general session on IBM's small systems directions and an elective session on System 34 and System 38. At no time, however, were specific future products described.

Will you please correct the misleading impression that your highly speculative article may have given your readers by publishing this letter as soon as possible?

M D STOTT  
External Communications Manager  
IBM UK

## Why help these regimes?

I AM becoming increasingly concerned at the activities of the recently formed "UK Council for Computing Development" whose aims include advising Third World countries on the implementation of sophisticated computing and data processing techniques. They are also advertising and handling the recruitment of computing experts and consultants for projects in those countries. Many of these projects apparently are for analysing national census data for "various government departments".

What concerns me in particular is that many of these countries to which the Council is sending advisors have an appalling record for the lack of human rights. For example, a recent request for help came from Turkey which is at present well known to be steadily killing, torturing and imprisoning ordinary people opposing the ruling junta. And one recently advertised request for help has come from Libya, and the reputation of that country's leader is worldwide.

In the UK we are well aware of the issues concerning the "privacy and misuse of data" held in vast computer databanks and the consequences of this data being wrong or used for unpleasant reasons. However thanks to our (approximately) democratic government at least we still retain most of our human rights if such data is misused. But what of the Third World countries where human rights are not enjoyed by anyone, especially those opposed to the politics of their government?

That is why I am concerned. Should we be helping those countries to further their aims of suppressing even further human rights?

NAME AND ADDRESS  
WITHHELD BY REQUEST

## Operating system omission

I MUST bring to your attention a serious omission (CW, June 10) in your article, A Guide to DEC Operating Systems. Under the section Independent Operating Systems, there is no mention of the most important and best of such systems, Unix (+) or its derivatives.

I know from other articles in your journal that you are aware of the existence of Unix (+) therefore why not include it for Unix (+) is probably used far more than the rest of the independently supplied systems.

IAN R. PERRY  
Laboratoire d'Etudes et de Recherches Synthelabn, Paris.

# DOWNTIME

## What upset the other princess

SEVERAL explanations have been offered for Princess Anne's expression of ignorance and indifference about the birth of our future King William V (barring revolution or cataclysm). One is that Anne cannot forgive Charles for looking like Big Ears rather than a horse.

Another explanation, less likely from the front line of accession to the throne.

A glance at the picture accompanying this anecdote shows what Anne was actually doing while the charming Princess Di was making such light work of her labour in London - looking round the Inmos chip factory in Colorado, conferring a formal blessing, unveiling a bronze plaque, and having tea



Princess Anne at the Colorado chip factory.

with Inmos employees in the cafeteria. That, reader, is how she spent a day while the telegram of congratulation to her sister-in-law remained unwritten.

## A cuckoo in the technological nest

BRITISH TELECOM was acting more like a "cuckoo bird" than a "Buzby bird" in its attitude towards competition, said a Conservative MP in the Commons. Like the cuckoo it was "seeking to eject fledglings from what it chooses to regard as its own exclusive nest".

British Telecom has lost its monopoly on certain products, including modems, and the MP feared it was preventing other companies moving in on its once exclusive patch.

Had some Opposition MP been sufficiently sharp, he could have used the cuckoo analogy to deliver a timely riposte. The cuckoo lays her eggs in nests of other birds to keep warm. But British Telecom, in being deprived of its monopoly, is having its eggs confiscated and reared by other birds against its will.

And at least a cuckoo hatches from a cuckoo egg, no matter what bird keeps it warm.

Hardly surprising then that news of Able's country retreat came from the UK office, but from California.

"The building was chosen partly for quaintness and location, but primarily for size," enthuses a US executive.

## This sporting life

MY warmest congratulations to the many Computers who took part in another round of fun and freak activity in the latest event sponsored by Computer Weekly.

Modesty precluded athletic Chad from demonstrating his prowess at the dribble, but few present are ever likely to forget how, after lulling the field to sleep in the 400 metres, he sprung like a cheetah to bury his prey in the graveyard of history.

One spectator likened the sprint finish to a Sun reporter making a bolt for El Vito in a thunderstorm.

Those who have observed such a phenomenon will know that the comparison is especially apt.

Chad

## A licence to spend?

"THE issuing of licences by the Swansea computer centre costs two and a half times as much per vehicle on the road as did the manual system it replaced - and that figure takes full account of inflation." So says Peter Davison who has helped compile a report urging that the Driver and Vehicle Licensing Centre's computer be scrapped.

However, it seems as if the government needs no such urging. If recent statistics are correct, it is already in the process of returning the DVLC to manual operation by Post Office clerks.

This will come as a relief to those who have suffered from DVLC's incompetencies.

But let us remind ourselves that the computer is as often a scapegoat as a villain in government departments.



## Counting on the abacus

NEW technology meets old as China begins counting its vast population. Speculation now has it at 1,000 million.

The abacus used for countless Chinese population surveys, will stand alongside computers for the counting.

A staggering six million census officers will take part in the hope of avoiding what Chairman Mao Tse-tung, man-made God, once described as ghost people.

## All their own work

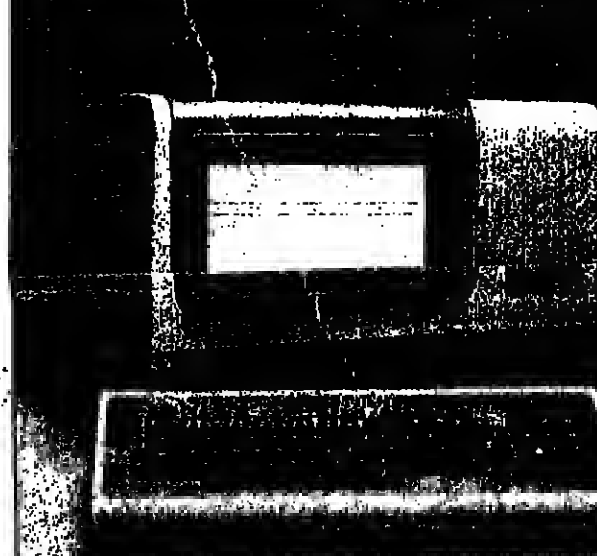
WHERE would you go to find out how many micros are installed in this country?

With the Financial Times' great interest in things computational you'd perhaps have thought that its Information Service might be a good place to start.

But when a large micro dealer turned to the Information Service to compare findings from its own researches with other available information, all the FT service turned up was one Press release - from the company itself.

Chad

# DEC VIDEO TERMINALS



- VT100 GREEN SCREEN £965
- VT100 STANDARD £980
- VT101 LOW COST £680
- VT125 GRAPHICS £1895
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## Meeting sick pay rules

AS one of the micro software companies referred to in the Software File payroll discussion referred to by Cliff Dillaway (CW, June 3), we agree wholeheartedly.

A good guideline to a supplier's capability in meeting the forthcoming sick pay regulations, however, will be provided by the existing facilities of its payroll system. If you find a system is not capable of easy user-adjustment for statutory changes in tax and NI, simply avoid it and use it as a clue to that supplier's overall software capability.

The micro software authority will require the software author to mark out the men from the (cow)boys.

DAVID JARMAN  
Managing director  
Jarmans Systems,  
St Albans.

## Cash for courses

YOU reported (CW June 17) about the way in which computer departments in universities and polytechnics were being particularly badly hit by public spending cuts.

Within the polytechnics subjects are classified into laboratory and non-laboratory for purposes of resource allocation.

Laboratory subjects are given more money for equipment and for staffing. Traditionally computing has been classed with the other sciences but this has now been changed, and it has been grouped with mathematics.

Apparently the computer and microprocessor laboratories in which my students work are a sign of my imagination!

Mrs L. P. ANTILL  
Polytechnic of the South Bank,  
London SE1.

## Liveware File

WITH THE GROWTH OF HOME COMPUTERS...

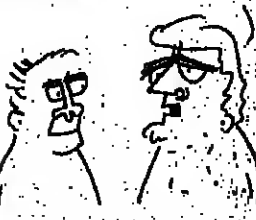


...AREN'T YOU WORRIED ABOUT THE NUMBER...

OF POTENTIAL PROGRAMMERS?

IS THE ISLE OF MAN T.T. CHAMP WORRIED BY MIPED RIDERS?

...AREN'T YOU WORRIED ABOUT THE NUMBER...



OF POTENTIAL PROGRAMMERS?

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# A BRILLIANT MINI THAT'S EASILY MANIPULATED.

The remarkable new Olivetti M20 personal computer.

Please forgive our boasting but the new Olivetti M20 really does make the current crop of computers look like toys for adults.

It's simply the most advanced personal computer in Britain.

The 16-bit central processing unit and 'bus' allow larger more complex programs to be run on larger amounts of data and at far greater speed.

It has two 5¼" mini floppy disk units with a capacity of 320k bytes each that are integral to the system.

(These can be further extended with the addition of a hard disk.)

And it has a minimum internal capacity of 128K bytes.

The result is an extremely powerful computer with interfacing capabilities that allow it to communicate with a wide range of peripherals.

That's proof that it's brainy, but it's also beautiful.

The visual brilliance and clarity of the VDU can be controlled as its position can be swivelled and tilted to suit the operator.

And as well as handling up to two thousand characters, the screen can produce a variety of complex, high resolution graphics.

Naturally, lines, circles, ellipses, bar charts and pie charts are a cinch.

But the screen can actually split itself into sixteen independent windows. It's all clever stuff but its language is simple.

It uses Microsoft® Basic which has been developed to a new level of professionalism. In fact, the advanced PCOS operating system combined with its programming language make the M20 easier to use than a typewriter.

But if you do manage to get lost there's a 'Help' function to guide you.

The M20 also has the reassuring ability to run through its circuits every morning and if any are faulty it'll tell you. So Olivetti's national can work even faster.

Send off the coupon and find out why the M20 is simply brilliant.

And brilliantly simple.

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For more information on the M20 Personal Computer please send this coupon to Valerie Belfer.  
British Olivetti Ltd., Olivetti House, PO Box 89, 86/88 Upper Richmond Road, London SW15 2UR.

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CW 1

DEM enquiries welcome.

**olivetti**

# As Ansi dithers, the Cobol user's voice may go unheard

CONFUSION surrounds the proposals for a new Cobol standard laid down last autumn by Ansi, the American National Standards Institute. Ansi is beset by public criticism of the standard received early this year, with the result that Ansi's own proposals may never crystallise into a new standard.

Instead, some leading Cobol pundits suggest, the US Federal government may lay down a new Cobol standard which contains most of Ansi's proposals unaffected by the public user's opinions.

This would be an unthinkable snub to Ansi, which has long been considered the definitive authority on the two granddads of the computer language world: Cobol and Fortran. The current document on international standards pertaining to Cobol simply makes a one-page reference to the Ansi standard.

The reason for the confusion over the new standards is that Ansi is taking a very long time making

up its mind about the recommendations of its technical committee X3J4 on a revised Cobol standard. X3J4 spent four years up until last autumn 1981 working on the new standard. A draft proposal was then made public for comment to be submitted.

The comment period closed in mid-February 1982, and since then 2,000 letters concerning the proposals have reached Ansi. According to Philip Brown, who is the National Computing Centre's representative on X3J4, these public comments mostly came in two categories: short letters complaining that the new standard is incompatible with the old; and longer letters also complaining that the new standard is incompatible with the old.

The complaints are founded on fears that existing Cobol programs will have to be rewritten where the new standard is implemented. Brown claims these fears are only partly justified. In practice, he says, old compilers continue to be

supported for several years after the new standard first arrives. Look at the 1968 Ansi standard, he says, which is still around.

On this basis, according to Brown, users have less to fear than they think. But Brown concedes that some of the complaints, mainly concerning minor changes to the language to dispel what might be called bugs in its logic, are legitimate.

In any case, Ansi is taking the complaints seriously, and Brown reports that divisions still exist within the review body about some of them. As a result, it will be several months more until a final decision is reached.

Brown is unsure of the final outcome. "The best guess I've heard is that there will be another draft standard," he tells me.

Brown fears there may not be sufficient agreement either to decide on a new proposed standard, or even to reaffirm the old one.

The suggestion is that if Ansi cannot come to a decision, some-

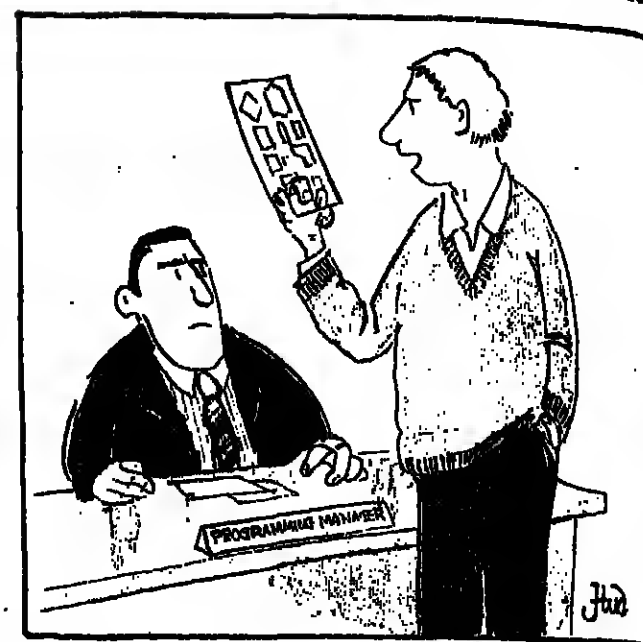
one else will have to. It could be the US government, or even in our case some UK body as a result of a new information technology initiative from the government.

It is ironic that because of Ansi's willingness to consider various shades of opinion, the user may end up having the original proposed standard inflicted upon him.

But it is also ironic that while so many complaints about the draft proposed last autumn by Ansi concerned compatibility, one intention of the proposals was to reduce the number of possible Cobols around.

At present there are 100,000 possible variations of standard Cobol. A reduction would be achieved by allowing only three subsets of Cobol: Minimum, Intermediate, and High, or standard Cobol.

One recommended change that I for one can see causing problems when large existing commercial Cobol programs are carried onto the new standard concerns file up-



"I give up - what is it, then?"

dating. The change concerns the timing of the decision of which record is to be read next during a file update. Normally the change will make no difference. But suppose that while updating an indexed sequential file, the program writes a record with a sort key just a little greater than the one just read. Under all existing standards, the

next record to be read would be the one sequentially following the one last read. With the new standard, it would be the one written, if its key is lower than the one due to be read next, but higher than the one last read. Confusing, is it not? Hardly surprising, then, that there have been reservations about the new standard.

## Drawing systems still cost more than artists

ARTISTS are not the easiest users to please, as two makers of television graphics machines have discovered in the past two years. One of the companies, Ampex, has withdrawn its telegraphics system, Aves, because at £100,000 it was too expensive either to sell as a computer graphics terminal, or to catch on with television studios.

An Ampex spokesman conceded that total sales of less than ten had been disappointing, and were the reason for Aves's withdrawal from the market early this year. The other company is Logica, whose graphics machine, called

Flair, is still alive. At £40,000, however, it is hardly a snip, and only six have been sold.

According to Andrew Love, a member of the development team, Flair is not an end in itself, but has spawned other useful developments. For example, Logica has an image processing system which grew out of Flair.

Love is an example of a fourth generation: of programmers who regard their task as being defined by the needs and idiosyncrasies of the final user of the system. I was impressed by the articulation with which Love and his colleagues at Logica explained their development problems, and refreshed that they, unlike some other programmers I have met, do not regard the end user as an awkward Granny beyond hope of understanding.

According to Love, Ampex had hoped to put one of its Aves in almost every television studio. But Logica had no such expectations,

he said, and is happy with a number of sales that had proved unacceptable to Ampex. Most of Logica's sales have gone to design studios rather than to television studios.

Flair consists of a tablet with a central rectangle representing the TV screen. The artist works by moving a pen with a stylus attached, and a cursor confirms the position on the real TV monitor placed somewhere in front of him. Only when he touches the tablet screen does the drawing begin.

The artist uses just one pen to draw on the tablet, but different colours and brush thicknesses are simulated by pressing buttons on the part of the tablet outside the central screen. Colours can be mixed by turning on a push switch. Up to 256 colours can be used, and are presented for selection at the bottom of the screen.

Artists who pride themselves on their ability to draw straight lines will be disappointed to find that Flair has this facility available as a function, as well as circles and ellipses. Curves of a specific size cannot, however, be specified in programmed code. But drawings can be stored and superimposed on the monitor.

"The main problem was with user interaction," says Love. Making it work can be extremely difficult. It necessitates the appointment of an operations person with a good knowledge of the operation, the applications programs and operating software. This person must be skilful in the handling of colleagues, particularly where their specialised knowledge is of a greater depth than his broad brush picture. He must also be a strong personality, not easily browbeaten or intimidated, but at the same time outward looking when approaching the hurdles to be overcome before a change becomes effective.

The system will not function effectively unless it has the full support and co-operation of systems, programming and technical services personnel and is under the authority of the data processing manager. This is the hardest part of all because it may call for a change in attitude, approach and in some cases loyalty.

Because any change to hardware or software should be introduced without disrupting the existing service, it follows that the management and control of change should be an operations responsibility. It is another step in the trend to give operations greater control over

## OP SPOT

New systems are often an op's nightmare. But this can be avoided with careful management, says Brian Pugh

# All changes should be controlled, not feared

CHANGES at data processing installations that are intended for the good of everybody have a nasty habit of becoming a source of anguish for operations and development and a bone of contention for the user. Instead of being the raison d'être of the department they can become its downfall.

New systems are often fraught with bugs which cause havoc to established schedules, a reduction in service levels and loss of goodwill. Sometimes programs that have run trouble-free for years suddenly become problematical after a minor amendment. Amendments can give rise to other amendments which, in turn, distort the original logic of the program to a point where debugging becomes a nightmare.

Hardware will display similar schizophrenic tendencies after a modification or change to the engineering level. This can be caused by a new card being faulty or adjacent cards being displaced during fitting. And the configuration can be enhanced while corresponding amendments to the software are overlooked.

Whatever the reason many operations managers, from bitter experience, dread change. Preserving the status quo is the only way they can visualise peace of mind. Yet it does not have to be this way. Change can and should be controlled in a manner that makes it a non-event. The implementation of a change should be transparent to the users who will benefit from it and should certainly not be visible to those who are not involved.

Where change goes wrong and service is affected, then there should be a backup and recovery procedures which can be brought into play immediately with swift results. If these conditions are met then the introduction of change should hold no fears for anybody. When this comes down to it is the management and control of change, a function which should be formally established within the operations group. There are still a number of installations that have not recognised the need for this essential activity, and even where it does exist there is a high probability that the authority with which it is administered is not strong enough.

The mechanics of a change control procedure are simple. Making it work can be extremely difficult. It necessitates the appointment of an operations person with a good knowledge of the operation, the applications programs and operating software. This person must be skilful in the handling of colleagues, particularly where their specialised knowledge is of a greater depth than his broad brush picture. He must also be a strong personality, not easily browbeaten or intimidated, but at the same time outward looking when approaching the hurdles to be overcome before a change becomes effective.

As interactive volumes increase due to new applications, degradation will be experienced on concurrent batch work, resulting in longer elapsed times. It is better to plan the change than to change the plan. Too many changes are implemented without any formal planning which, as a pre-requisite, must involve all parties concerned. Consequently, individuals make such changes without realising, until too late, the effect they have on other programs, personnel or other areas of activity. Night shift operators in particular are prone to suffer the results of this lack of foresight.

All aspects of change must be planned with estimated times for the completion of each stage. These will include the time to prepare the change, the amount of testing time, the resources required for testing, amendments to JCL, operations and user documentation, and the preparation of contingency plans where appropriate.

Having planned the various elements of the change, it is necessary to monitor progress and co-ordinate the efforts of the individuals concerned. Depending on the nature of the change every activity

their own destiny and thereby increase their accountability for the level of service provided.

A change is anything that alters the configuration, the programs, the procedures or the environment as they exist. It can be a new suite of application programs or a minor amendment to a listing program, a new operating system or a fix to the existing one, a new CPU or string of disc drives, or a non-critical engineering modification. These changes may be originated by users, technical services, systems development, operations or outside suppliers.

Whatever its source or intent, it will constitute a hazard to the smooth running of the installation if not introduced correctly.

The first stage in the control of change is the assessment of the implications of the proposal. Like any proposal it should be subjected to a critical analysis.

The reasons for the change should be examined to see if they can be achieved in any other way. Are the reasons sufficient to warrant a change? Will the proposed

**Giving operations greater control over change is another step to giving them greater control over their own destiny.**

change achieve the desired purpose?

Once these questions have been satisfied, the effect of the change on existing resources must be looked at. Major changes may require additional equipment or new software aids. Even relatively small ones may consume the last of the available disc space through increased file or library requirements. The possibility of augmenting resources must be measured against the deadline specified by the person making the request.

If changes could result in an increase in volume or timings, then these must be looked at in the light of existing scheduled commitments. An overnight batch job could be delayed at the start of the day if the processing time of the batch job is extended to the point where it cannot be finished in time.

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area within the department could be involved, so the change controller will have to liaise with analysts, programmers and engineers as well as members of his own team.

He will have to have sufficient authority to ensure that co-operation is forthcoming from non-operations personnel. A change in attitude may be called for because in these circumstances a development staff will find themselves accountable to operations. While against tradition, it is essential if the change is to go ahead smoothly and on time.

Because there are likely to be a number of changes in progress at any one time, change control will co-ordinate the interaction, dependencies and priorities of changes where it is necessary. Having a single point of control will also eliminate any duplication of effort.

Because the majority of changes will be small-to-medium in terms of resource and impact, change control is really project control in miniature. But changes should never be reviewed in isolation. Co-ordination should be the consequence of regular and representative meetings monitoring the progress of all changes against the background of other pertinent events.

Like everything else in data processing, pre-implementation testing is the key to trouble-free change. Nobody pretends that thorough testing is easy, but in an effort to ensure that the tests devised are adequate they must be subjected to a critical analysis as well.

Do they really test for all known conditions? Does the change produce the required effect? Do the tests check for any unexpected results in another part of the system? While it may appear obvious, in practice these questions are frequently overlooked. The easier a change looks, the less care is taken in testing.

Minor changes fail more frequently than major ones, and because of their higher incidence they give the outside world the impression that the computer department can never do anything right first time.

The change controller comes into play at this stage. Although he does not have a detailed knowledge of each program, his overall knowledge of the system will tell him, broadly, the function of each job step. This should enable him to look for pitfalls which a programmer, concentrating on a specific program, may miss. It is up to the change controller to satisfy himself that adequate testing has been carried out before allowing implementation to proceed.

The right to question the quality of work done by programmers or analysts is another factor which may result in offended sensibilities. But if it is done constructively and received in the spirit of a common goal, it should be mutually beneficial.

No matter how thorough the preparation and testing, there is always the possibility that things will go wrong. Risk is inherent in change, and with multiple changes the risk is compounded.

To combat the risk, backup and recovery plans must always be available to correct such situations. Depending on the size and complexity of the change these may be elaborate or simple, automatic or manual. But they must be easy to bring into operation and swift to take effect.

They can vary from the simple expedient of using an earlier version of a program, if an amended one fails, to having a team of



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heavyweights on site to perform instant corrections. If your operation is less than seven days per week then all major or complex changes should be scheduled outside production hours.

If everybody involved has knowledge of a planned event and what part they will play in it, then even if it goes wrong it will not be so much as an unexpected occurrence. Regrettably this is one area where most of us fail. Telling somebody what you are going to do does not get the job done. Instead we concentrate on doing it, and find there is insufficient time to tell anybody.

It is imperative that all formal channels of communication are opened. It is here that the change controller has an important role to play. Where relevant, revised operating instructions must be available, schedules changed and user manuals updated. Computer operators and terminal staff must be instructed in the nature of the

change and the likely consequences. Managers must be informed of changes to the format of their reports or the timing of their expected output.

If there is any alteration to user output, the test results must be confirmed by the user before the change is implemented. If a change necessitates taking the system down, users must be advised in sufficient time to enable them to get urgent work processed before the event.

The controller must have the authority, on behalf of operations, to refuse to accept any change if he feels that insufficient preparation has taken place or if for any other reason the change will cause an unwarranted disruption to the service provided. While his right of veto gives him the final responsibility for acceptance, it does not absolve the person who prepared the change from his qualitative obligations.

In areas of conflict over the

suitability of the change, the change controller will require the backing of both the operations manager and data processing manager. It is here that the DPM may find his loyalties divided.

A history of the change, with its progress through each process, will serve as a tool for future improvement. An evaluation of the effectiveness of the change and its progress should indicate whether it could have been done better, differently or whether further changes are necessary.

Variations in performance following a change may be a pointer for tuning requirements. A high volume of program or system changes may indicate that design standards are inadequate. Depending on the character of the installation a number of conclusions may be drawn by monitoring the effects and nature of the change.

● The author is a computer consultant specialising in operations.

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# Successful BT product may ruin the companies it serves

Sea freight forwarders fear ACP80 offshoot could squeeze them out of business, says Anthea Ballam

IT would be a sad twist of fate if one of British Telecom's most outstanding success stories — the tale of ACP80 (air cargo processing in the 80s) — evolved into an unhappy and bloody political argument between supplier and user.

Already a deep-felt bitterness is developing from within the freight forwarding industry, and fears are rising that Direct Trader Input (DTI), which has grown out of ACP80, could hit hard at the maritime freight industry, causing thousands of redundancies and threatening the existence of the industry itself.

How has this situation come about, and what can be done to stop the rot?

It all began in 1971 when Laces, London Airport's cargo processing system, was introduced for handling documentation and cargo administration. The system was widely acclaimed by both air freight concerns and overseas airport authorities, and when its successor ACP80 appeared in December of last year, it was accepted that British Telecom, via the National Data Processing Service (NDPS) had become the world leader in such matters.

ACP80 marked a significant number of firsts. It was the only cargo processing facility to enable private companies to link their own systems into a public service, the only facility to handle both imports and exports and the first to have the potential to handle both air and sea freight.

This may have been the first mistake for, as several freight forwarding concerns have explained, the differences between air and sea freight operations are enormous.

But in its own right ACP80 remains a great achievement for British Telecom. It is the developments that have grown out of the system that pose the threat.

ACP80 is run on ICL 2966 mainframe systems (a configuration that is shortly due for upgrade). The existing tasks for the NDPS system, include the handling of import and export inventory control documentation for some 35 airports and others as well as similar services through communication links to six top airline mainframe facilities.

Export, complement, reception

to HM Customs and Excise, and the production of trade statistics on goods, are also controlled.

In close association with this service (although it was contracted separately) is the Departmental Entry Processing System (DEPS) the latest data control facility run by HM Customs, intended to improve the flow of trade goods at the maritime ports.

The contract to handle DEPS was justifiably awarded to the NDPS on the basis of its proven success (with ACP80) and the system runs on a mainframe in tandem with the ACP80 system at the NDPS computer facility at Harmondsworth, near Heathrow.

At the beginning of May, DEPS became operational at Dover, Felixstowe, Folkestone, Harwich, Hull, Liverpool, London, Manchester, Southampton, Stratford, Tilbury and Manchester Airport. The enhanced service allows agents and importers to declare goods at ports where Customs officers enter details through video terminals to the Harmondsworth configuration.

Heralding this important change was the introduction in April of a new form, C12 (a revised version of its predecessor C10) which has not been greeted with enthusiasm by the freight forwarders.

The introduction of DEPS is seen as the first stage of yet another development, direct trader input (DTI) whereby freight forwarders will be able to input details of Customs entries automatically over dumb terminals linked up to the central mainframe facility at Harmondsworth.

The introduction of DTI to cut costs in processing HM Customs data entries has cast maritime freight forwarders into gloom and despondency, coupled with the fear that introduction of such a service could strike at the very heart of the industry.

The appearance of the C12 form has provided maritime freight forwarders with their first taste of DEPS, and they are not happy. John King, a manager at the Dover branch of the Bow Patmar freight forwarding group, expressed his early impressions of DEPS in no uncertain terms.

DEPS became operational at Dover in May.

hours to deal with Customs clearance when we used the C10 form, and now clearance has gone up to nine or 10 hours. This affects us and our customers very adversely.

"Customs tell us that because the form is coloured blue and because the format is complex it takes a great deal longer to check it. In many cases the forms are presented incorrectly because they meet with no familiar standards; also unlike the previous forms, they do not include carbons, so we spend a great deal of time in just handling these forms and inserting carbons for duplication purposes.

"Ultimately this must increase our costs in documentation handling. One has to type the information in black otherwise the form is rejected. The boxes are so small that you can imagine that when a Customs officer has been working a long even- or eight-hour shift, he cannot possibly distinguish be-

**The freight forwarders and their suppliers feel that they have been railroaded into a monopolistic situation whereby HM Customs can decide on what computer terminal or facility they may need, and who may subscribe to such a service, and continue in business, and who may not.**

tween correct and incorrect information.

Another articulate critic of this early manifestation of DEPS is Peter Day, managing director of Impatex, a systems house specialising in the provision of micro-based computer systems for the freight industry. Day pointed out that C12 was a conspicuously poor piece of design that was not standard for any normal typewriter. Constant realignment was required in order to input the data correctly.

Day's greatest fear, however, is the introduction of direct trader input (DTI) which he sees as an ingenious method of making the freight forwarders pay for the privilege of paying Customs duty, as they will be "acting as unpaid cus-



The maritime cargo business is an ancient one, with a multitude of companies working from each port.

DTI, phase two of DEPS, are expected to involve an HM Customs recommended terminal that will be available (at a cost) to the maritime freight forwarders to access the central facility.

One freight forwarder expressed the belief that this could ostensibly put paid to the freight forwarders themselves. It will certainly squeeze out the many systems houses serving the industry. The Customs would decide the systems standard, and all other configurations would be incompatible with the DTI terminal.

Because the central facility will

may need, and who may subscribe to such a service, and continue in business, and who may not.

Day expresses the belief that mishandling of DEPS and subsequently DTI is historic, and springs from an inability to comprehend the radical differences between air cargo business methods and the maritime freight industry.

The air cargo companies, like the industry itself, are young. They are by necessity all local to both Heathrow and Gatwick, and making available centralised computer facilities, like the introduction of data processing systems to such early birds is a simple matter in terms of planning.

By comparison, the maritime cargo scene is a different one altogether. The concerns involved are often ancient organisations that seem to have existed almost as long as sea trade itself. In Dover alone it is estimated that there are some 250 freight forwarding concerns, varying from the larger concerns like Bow Patmar and Kuehne and Nagel down to Fred Bloggs, his assistant and his micro-cum-word-processor.

Peter Day is not alone in the belief that DTI is in reality Customs' answer to government pressure to offset costs in processing Customs entries onto the cargo companies themselves. DTI would certainly reduce the staff required to input data entry details to the central Harmondsworth computer facility.

So far, early efforts at DEPS have certainly proved unpopular and now would be an opportune moment to reconsider the other options available. Meanwhile, rumours are rife that Ballastown has been the chosen venue for early experimental trials into DTI, but HM Customs is unwilling to comment on this or responses to DEPS and the new C12 entry document that has been received with such lack of enthusiasm.

Understandably, the freight forwarders and their suppliers feel that they have been railroaded into a monopolistic situation whereby HM Customs can decide on what computer terminal or facility they

Peter Day believes that some

form of DTI is inevitable, but it should not be based exclusively on a centralised system. Because of the disseminated nature of the maritime freight industry he believes that some form of network structure is essential, with the freight forwarders able to input data at will with their own choice of hardware and only guideline protocols for communications access to the system.

In this way users would be free to invest in the data processing equipment of their choice, a fundamental freedom that should be open to any and every form of commercial enterprise. To dictate what terminal should be available for DTI is, he believes, a monopoly of the worst kind.

Commenting on the insecurity of the freight forwarders and their need to determine both standards and freedom in DP systems, John King of Bow Patmar cited an occasion in 1979 when a number of freight forwarding agents pooled together to buy a £20,000 Burroughs configuration. The system was designated to handle Customs entry documentation and other functions based on such forms produced. With the introduction of DEPS and the new C12 requirements the system is now obsolete or must be radically re-designed.

The maritime freight forwarding industry is balanced on a cliff edge, awaiting news of DTI in whatever moment HM Customs may choose. As one executive explained, the industry is in great need of introducing automated systems to make it more efficient, and most understandably many companies want to invest in DP and WP now.

At the same time, nobody knows if DTI is going to be standardised, as nobody dares invest. It is even more curious to consider that this dangerous and worrying situation has all been born out of the unequivocal success of Laces and its new cousin, ACP80.

## MINICOMPUTERS AND PERIPHERALS - 1

John Aczel begins our three-page feature with a look at trade figures for peripherals. Deficit will probably continue

# Vigorous sales push abroad needed to right the balance

BRITISH sales of peripheral equipment in overseas markets are softening, and have dropped in value at the beginning of 1982. These conclusions emerge from the latest published Customs and Excise trade statistics which refer to January 1982.

There has been some delay in collecting the trade figures owing to computer problems experienced by the Customs and Excise department, so that the figures have not come out as quickly as usual. Nevertheless, the underlying trends are quite clear and indicate some weakness in deliveries in many key markets.

Undoubtedly British computer

firms are meeting strong competition in some markets and lower sales have been reported in certain European countries. In particular, deliveries to the Netherlands have declined by over 25% compared to the previous month, while those to Belgium were easier in this period. Sales to Switzerland and Spain were also down, but, in contrast, higher deliveries have been recorded to West Germany and Italy.

One encouraging feature, however, is that the British exports of computer peripheral equipment have been gaining ground in the Middle East and rising deliveries have been seen in that region dur-

ing January. In particular, sales to Saudi Arabia were up by 8% and reached a new peak of £2.1 million.

It is interesting to look at the trends in exports by volume, as actual numbers exported have gone up during January. Whereas the total number of peripheral units sold abroad amounted to 24,900 in December, this figure went up to over 26,700 in the following month.

Imports of peripheral equipment have remained at a high level, even though they were slightly easier during the early part of 1982. In January, total deliveries from abroad amounted to £43.5 million, which was a decline of 8% compared with the previous month.

In terms of numbers, there has also been a drop in imports, though the fall has not been as significant as in value terms. Thus 55,900 peripheral units were im-

ported as against just over 58,400 in the previous month.

These figures reveal that the US maintained its dominance in the peripheral sector, though its sales in January were lower. American deliveries accounted for nearly 60% of total imports, and other countries have made further inroads into the British market. This was particularly the case for France and West Germany, while sales by Italy were well maintained in this period.

On the whole, Britain will continue to have a major deficit in the peripheral sector; the latest situation indicates that imports have exceeded exports by £13 million, and this trend is unlikely to change, at least over the coming few months. Unless sales abroad are built up more vigorously, this imbalance will continue, and may even increase significantly in the course of 1982.

John Aczel is a consultant.

	January 1982 £000	December 1981 £000	Sept-Dec 1981 £000
Belgium-Luxembourg	889	1,278	5,596
France	5,337	5,365	24,694
Germany (West)	6,167	5,633	30,387
Italy	3,346	2,727	15,681
Netherlands	976	1,337	6,285
Norway	775	310	1,392
Saudi Arabia	2,144	1,978	3,562
South Africa	1,089	1,487	5,178
Spain	864	1,422	4,786
Sweden	1,382	1,345	6,272
Switzerland	1,493	1,830	6,118
US	1,028	1,493	7,001

Figure 1. British exports of peripheral equipment (by main markets).

	January 1982 £000	December 1981 £000	Sept-Dec 1981 £000
Belgium-Luxembourg	332	792	3,287
Canada	490	376	2,290
Denmark	403	113	1,199
France	2,084	1,915	9,071
Germany (West)	3,842	3,531	13,396
Ireland	778	1,066	4,614
Italy	3,303	3,381	16,030
Japan	1,082	1,881	6,862
Netherlands	2,455	2,496	6,660
Spain	568	642	7,059
Sweden	919	1,413	5,763
US	5,992	26,812	112,099

Figure 2. British imports of peripheral equipment (by main suppliers).

	January 1982 £000	December 1981 £000	Sept-Dec 1981 £000
Peripheral units			
Disc storage units	3,546	3,734	17,123
Magnetic tape storage units	294	1,085	3,446
Other storage units	369	184	1,331
Printers	2,342	3,213	11,581
Readers and punches	381	725	4,036
VDUs	13,817	11,571	56,752
Other terminals and consoles	1,198	1,106	4,355
Other peripheral units	8,395	10,625	42,344
Offline data processing equipment			
Punches, verifiers and calculators	20	10	57
Other equipment	285	347	1,985

Figure 3. British exports of computer equipment by product groups (by value).

	January 1982 No.	December 1981 No.	Sept-Dec 1981 No.
Peripheral units			
Disc storage units	1,758	1,432	7,053
Magnetic tape storage units	375	841	1,804
Other storage units	212	54	447
Printers	3,422	2,191	7,689
Readers and punches	91	176	873
VDUs	12,580	10,578	54,197
Other terminals and consoles	309	271	1,811
Other peripheral units	7,071	9,397	36,681
Offline data processing equipment			
Punches, verifiers and calculators	9	15	326
Other equipment	258	454	5,433

Figure 4. British exports of computer equipment by product groups (by volume).

	January 1982 £000	December 1981 £000	Sept-Dec 1981 £000
Peripheral units			
Disc storage units	9,331	10,039	39,729
Magnetic tape storage units	1,464	2,229	12,379
Other storage units	1,352	780	2,668
Printers	7,666	10,356	39,174
Readers and punches	230	276	1,186
VDUs	4,885	5,510	21,555
Other terminals and consoles	2,600	2,363	11,867
Other peripheral units	16,059	15,793	72,220
Offline data processing equipment			
Punches, verifiers and calculators	46	24	317
Other equipment	1,038	1,255	4,586

Figure 5. British imports of computer equipment by product groups (by value).

	January 1982 No.	December 1981 No.	Sept-Dec 1981 No.
Peripheral units			
Disc storage units	9,375	12,721	38,017
Magnetic tape storage units	1,402	479	11,925
Other storage units	714	1,869	3,280
Printers	12,725	14,022	57,618
Readers and punches	578	419	1,971
VDUs	8,857	9,743	33,391
Other terminals and consoles	3,147	2,407	13,465
Other peripheral units	19,087	16,719	83,367
Offline data processing equipment			
Punches, verifiers and calculators	48	67	841
Other equipment	3,088	2,320	8,087

Figure 6. British imports of computer equipment by product groups (by volume).



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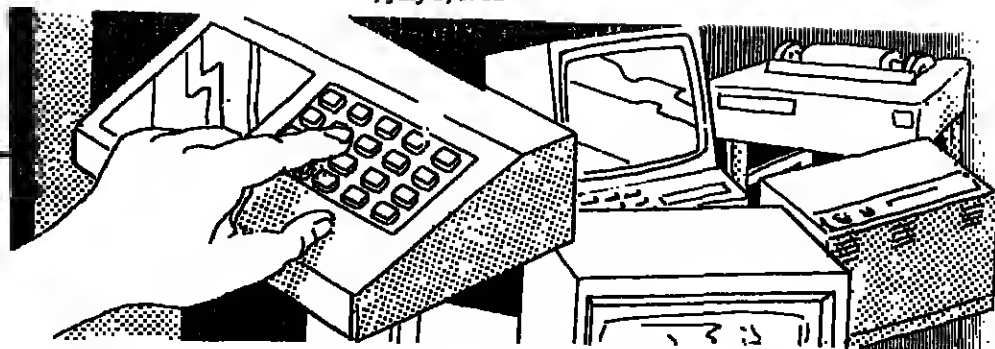
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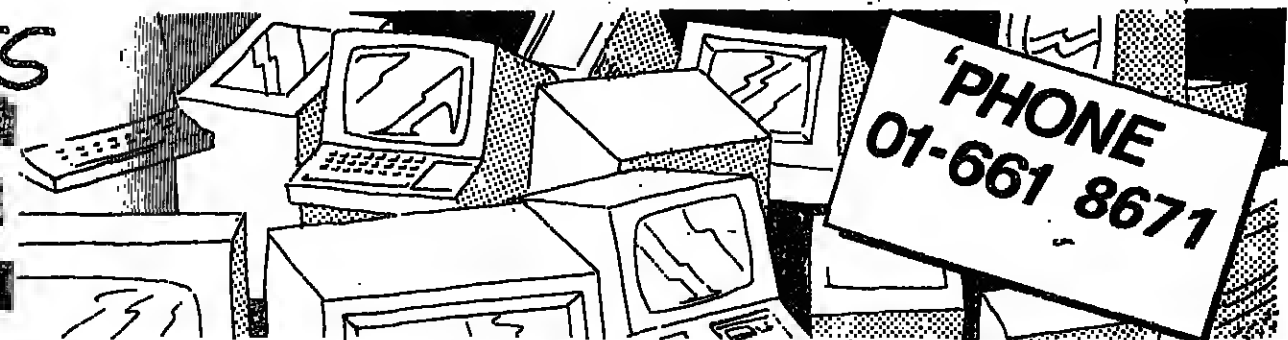
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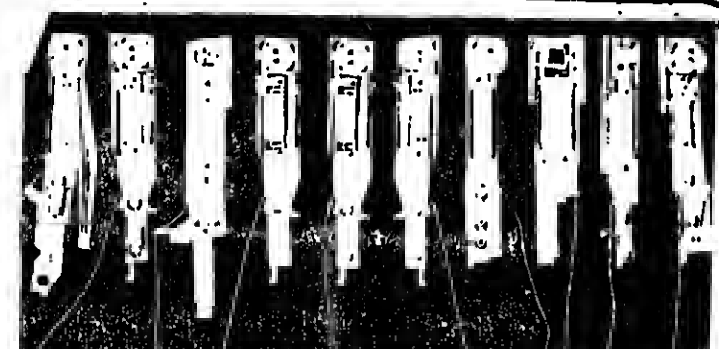
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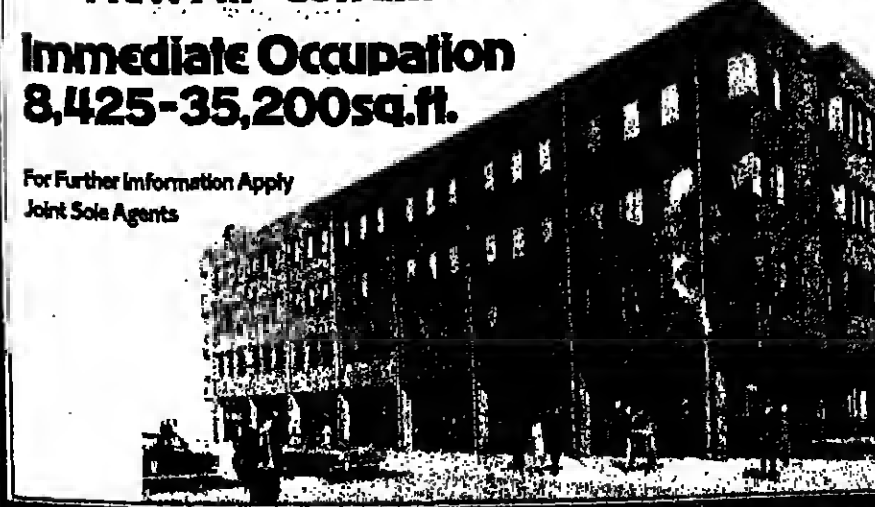
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# How to be fail-safe without duplicating the system

Waiting for maintenance calls means loss of business... Tony Smith gives some recipes for resilience

MINICOMPUTER suppliers, pioneers in the development of low cost interactive transaction processing systems for small and medium-sized companies' general computing requirements, have a strong foothold in distributed processing.

Both markets require a high degree of fail-safe operation for the user. The more he depends on his terminal-based computer system - to process, for example, his sales ledger - the more vital it becomes for his system to be operational during the working day. Waiting for maintenance calls means loss of business.

Minicomputer suppliers are now thinking in terms of offering some form of resilient processing capability that avoids the heavy expense of complete dual processing, previously the only method on the market but way beyond the budget of most companies.

The new approach is to add a series of hardware and software techniques to existing configurations that will enable any organisation to add safety to its interactive computer system - only where it is required and where it can be cost justified.

Nowadays the typical minicomputer user is not necessarily a small company, largely because the power packed into these systems, particularly in interactive networking environments where terminal control is often managed by specialised microprocessor-based subsystems, compares favourably with many mainframes.

Many companies have developed online, interactive databases with terminals operating in real time. Such systems are transaction based, so that as orders are received they are put on to the ledger, stock is updated, invoices are output, picking orders are listed and warehouse hills are printed out.

Hence there is a new and wider need for non-stop resilience in the commercial and minicomputer environment, because in all computer systems, however reliable, both hardware and software occasionally fail. Resilience cannot change this basic truth: it gives a system the ability to cope with failure and still keep on running.

Traditionally, resilient non-stop computing has been associated with defence systems, oil pipelines, banking, and has carried a heavy price tag. Non-stop computing has been provided by specialised configurations each specifically engineered for the particular job at hand; or by duplicate systems standing idle until needed. Most commercial computer applications could not normally justify such expense on under-utilised capital equipment.

For the small business systems user with just a few terminals linking key areas of his business, some form of fast recovery mechanism protecting his database from hardware or software failure is very attractive. Any "incident" is reduced to just a hiccup in the availability of his data.

However, it is unlikely that he can justify expenditure on duplicating any aspect of his computer system. But later, as his dependence on the computer grows, that decision might change. Ideally, he would build in just enough resilience to cope with the most likely causes of failure, such as electrical failure or operator input error.

A method of adding simply a fast recovery option, which holds information either on disc, or on optional memory boards, with on-board battery backup, and which could be added to standard hardware and programmed to offer fast recovery to standard system software had to be provided.

For the most part its addition means the purchase of no extra discs or main memory. In case of hardware failure, as in a power cut, the recovery of information is well protected and is effected when the system is re-started.

In the case of software failure, a fast recovery option will check-point the progress of applications level software so that following a program failure, the database is quickly returned to a consistent state.

Integral to this approach is the need to protect the database against corruption and against inconsistencies that might arise from incomplete update sequences. Database operations frequently involve many separate but related updates. For consistency, these updates must be applied as a complete set.

The fast recovery option suggested here would ensure rapid and automatic recovery to a consistent state - even when a hardware or software failure comes in the middle of update processing.

Following a checkpoint call it is important for a database system to maintain "before lock" copies of all records subsequently updated. A database management system will continuously monitor access to the database and provide the facilities for multi-stream updating. This resolves contention and takes fast recovery action in the event of user program failure.

Data can be protected against contention by locking both at file and record level. Programs accessing locked records will be queued until the lock is released. If a program fails while it is holding locked records, the database system will automatically release the locks as part of its fast recovery mechanism.

But a user also has to weigh the possibilities of much more disastrous failures, such as a head crash on a disc drive. When the disc goes, everything goes. In addition to the fast recovery option, manufacturers should also offer a second level of resilience to enable the user to take up the option of mirroring his discs.

In each case the decision should be the user's. He should be able to assess the possibility and the effect in relation to his business and the cost of doubling up on his discs. This can be a straight forward decision, but it will give him the opportunity to make.

A mirror disc option added to the existing computer system ensures that even after a catastrophic failure of a disc drive, there is no break in online service. Completely transparent to the user program, each physical disc drive may be mirrored with a second drive identically updated.

Database updates are automatically applied in parallel in full resilient systems, with two mirror images of the data maintained on physically separate drives. Data is read from either disc drive. Failure of any mirrored disc causes automatic and instant takeover to the alternative drive.

Recovery of a disc returned to service is also automatic. The database management system will bring it back into use, progressively updating its contents as a background activity.

Any disc drive can be mirrored - including the drive used by the operating system for virtual storage transfers.

Some organisations' commitment to multi-user, terminal transaction processing is such that they require full online processing to continue uninterrupted, even after total failure of a processor, with uninterrupted access to the up-to-the-minute database. This



Resilient non-stop computing has traditionally been associated with banking

is, of course, the traditional approach to "non-stop" computing.

In full resilient systems, two otherwise independent computer systems can be linked to act together as an integrated dual system. Each has full online up-to-date access, communicating with, and checking its partner through the link. Thus high throughput and resilience are achieved.

Each has its own instruction processor, store, disc controllers and input/output processors. The disc drives are dual-port units, connected directly to disc controllers on both systems.

Each system runs under control of its own operating system, within which it runs its own copy of the database software.

Using the link, the database software extends its responsibilities for database integrity. The link must have a monitoring function to test and report on both systems. Following the total failure of one system, the database software in the other can take fast recovery action. The database is returned to the consistent state of the previous checkpoint, and any record locks held by the failed system are released.

Such a link, in normal use, can provide important performance benefits as well. Because the traffic is usually low-volume, each system achieves a high percentage of its full work potential.

Most minicomputer manufacturers offer the user some form of transaction processing package. These bring to the user the benefits of online transaction processing without the need for very specialised programming skills. Applications are programmed in Cobol, with the transaction processor providing VDU handling and real time operations.

To support resilience, the transaction processing software must have a particular architecture. The transaction processor separates foreground VDU handling from middle ground file updating. Between the two stages is the transaction log file, held on disc and containing completed transactions awaiting middle ground processing.

In a dual processor environment, each system runs standard transaction processing software with its own foreground, middle ground and log file with the processor link used for communication and co-ordination between the two systems. Both transaction log files are held on shared disc drives, available to both transaction processing systems.

Normally, transactions are fully processed by the system controlling the VDUs from which the transaction originated. In the alternative mode, one system may be directed to process, in the middle ground, transactions arising from the foreground of both systems.

The transaction processor in the middle ground in the remaining system now takes over processing of transactions in both log files. This involves completing any mid ground processing in VDUs connected to the failed system may be switched to the remaining system.

After re-identifying himself to the system, each VDU user is informed of the last transaction successfully completed - even if he is now using a different VDU.

This approach of graceful resilience is a new concept. It allows a data processing manager to drive up a hierarchy of his own resilience requirements. For every application he should assess the potential cost, and the ease and speed of recovery. He can now apply resilience, only where and when the application demands it, his company can afford it and the cost can be justified in straight commercial terms.

Tony Smith is marketing manager for the Momentum series of minicomputers at Computer Technology Ltd (CTL).

systems capable of supporting 32 or more terminals.

The largest users of key-to-disc are generally in central government, nationalised industries, insurance, credit card and mail order companies, ie those with large centralised computer facilities and a data preparation requirement that cannot be cost effectively entered directly into the mainframe with online terminals at source, or by some other means such as OCR.

These centralised key-to-disc systems are staffed by specialised management and operators with equipment that continues to be developed to provide more cost effective keyboard entry media.

In many cases, key-to-disc systems have shared the same processor source and the same overall configuration as general minicomputer business systems, but one major distinction was always apparent: key-to-disc was designed to collect, validate, store and subsequently transfer, data entered at extremely high speed and in high volume by multiple specialist operators. High-speed terminal interfaces and other associated controllers were necessary, as well as very specialised and specific software facilities. In the mid-Seventies such facilities were very different from those provided by minicomputer systems.

Over the last few years, however, a positive new approach to data preparation has evolved, which indicates the trends for the Eighties.

"Integration" and "diversification" are the two most descriptive words for key-to-disc evolution over the last two years. The main developments will be in these areas:

● Communications, particularly interactive communications, within the framework of the key-to-disc system, have expanded the

application areas, provided a multi-use terminal, and possibly even stemmed the tide of data entry via specific, online terminal systems, for example 3270 and 7502 emulation.

● File handling capabilities have further extended the front-end validation capabilities (available on key-to-disc almost since its introduction) and further reduced the requirements for complex input routines being developed on the mainframe. They have also substantially lowered the costs and mainframe programming responsibilities for changes dictated by its users.

● Extensions to the processor controlling functions have included certain application processing functions by the introduction of user oriented programming languages, for example Cobol and Basic.

● The use of alternative input devices such as OCR, handprint recognition terminals, point of sale devices, etc, have further decreased manpower costs within the DP department, but under the control of key-to-disc, have provided and ensured that a single coordinated stream of data to the mainframe has been maintained.

● Facilities have been provided which enable users' data preparation requirements to be met by the use of their own terminals and which enable control of applications to rely less and less on centralised system level specialists.

Reports on future trends still indicate that the data entry market will remain essentially keyboard oriented. Key-to-disc as previously defined, however, will be supplemented in manpower terms, and possibly exceeded in hardware purchasing terms, by a closer integration with OCR equipment.

This is particularly true where large centralised computer installations and procedures have historically led to large key-to-disc installations.

The increased capabilities of OCR in both numeric and alpha handprint recognition will no doubt overcome a proportion of the need for keyboard input, particularly where there is some level of control in terms of source document completion. Further developments in hardware/software character recognition will increase the number of applications suitable for OCR.

Key-to-disc will be providing a complementary solution via keyboard input to applications not suitable for OCR.

For the smaller user there will be similarly significant but different changes in key-to-disc, particularly in the area of diversification of usage. This will almost certainly lead to substantial hardware changes with less dependence on centralised controllers and storage.

For applications still needing final central processing there will be a central control requirement with less emphasis on size of hardware (as has been the case with large key-to-disc installations) and more emphasis on network control and communications interfaces to a variety of mainframes.

A continuing trend will be towards a personal workstation approach. Activities will be controlled by the application experts at source and these will be extended well beyond data entry and the associated functions outlined above.

Software and hardware developments at a local terminal level will almost certainly include graphics, tables, word processing, viewdata and a variety of program

# Falling costs make key-to-disc an important UK market

DURING the last decade, in parallel with other computing equipment, the overall cost of key-to-disc has been reduced by some 50%. Compared with the increase in salaries of data preparation staff, smaller and smaller configurations can be cost justified, which has made it an important market for several UK companies.

Not until the late Sixties did data processing management begin to evaluate equipment which would materially reduce the costs of data preparation. The equipment initially took the form of magnetic tape encoders, but these in time were quickly overtaken by a rush of key-to-disc systems offered by minicomputer manufacturers.

Manufacturers were quick to capitalise on the fact that data preparation probably absorbed up to 25% of a total DP budget; was the most labour intensive section within the DP department with probably the highest potential for human error; and traditionally had an unfavourable productivity standard.

While several key-to-disc or diskette systems have been on the market, the concept is probably best explained by the name it is given by central government, PCK: processor controlled key-to-disc equipment. By sharing the capabilities of the processor and associated peripherals (eg disc, tape, printer, etc) the overall cost per terminal was kept to a minimum. This was particularly so on those

The data entry market will remain keyboard oriented.

systems capable of supporting 32 or more terminals.

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Data preparation probably absorbs 25% of the total data processing budget, as in this local government installation.

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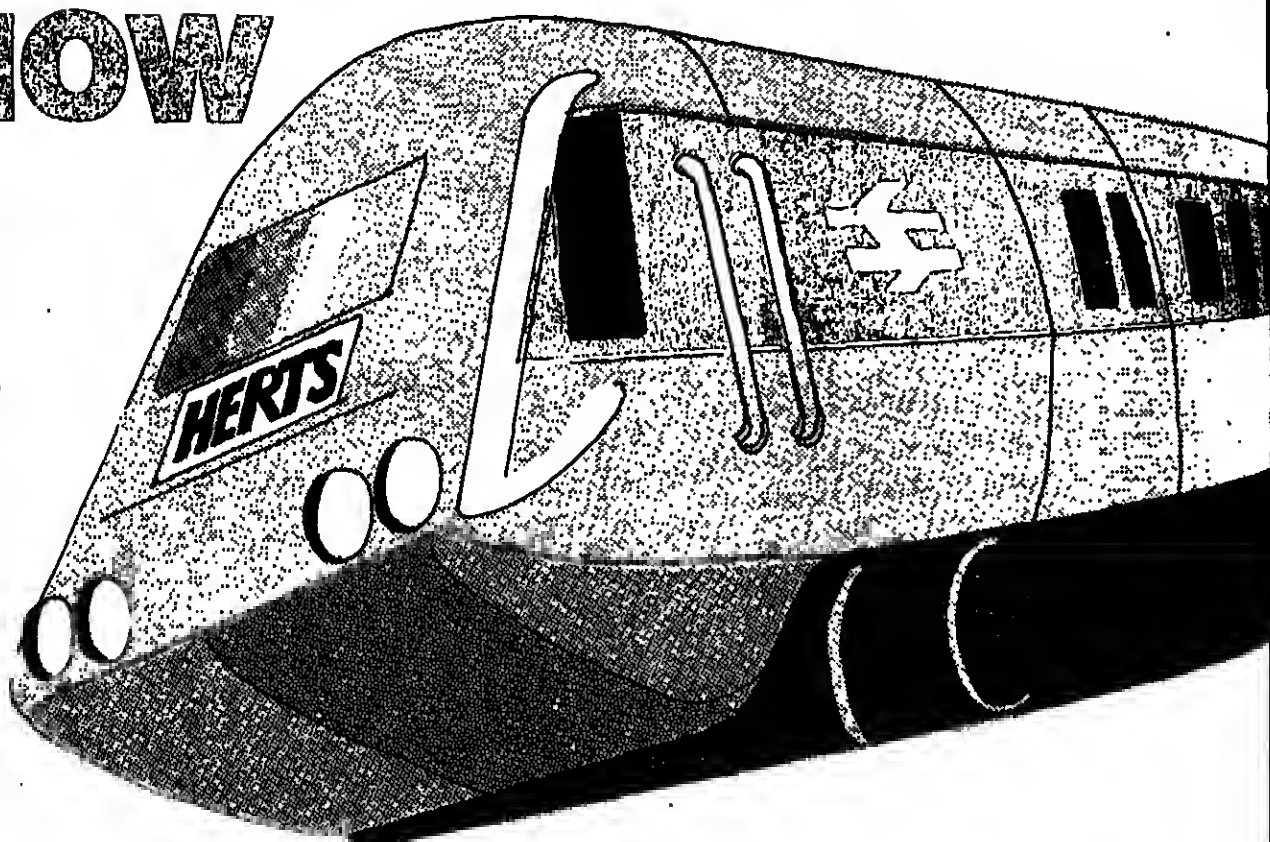
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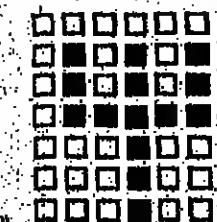
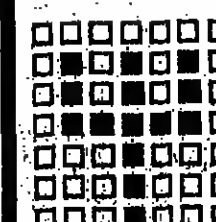
Assignments for this project are scheduled to start very  
shortly and will be for a period of approximately 18 months.  
These contracts will be lucrative and staff will be required to  
work in Southern England. Interviews for these appointments  
will be conducted during the next few weeks.  
For future information please contact:

ALAN PAINE - 0252 516141

TRIDENT COMPUTER SERVICES PLC  
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To discuss your next career step contact DAVID WAIN on 021-643 1994 9 a.m. to 6 p.m. or on 021-777 7427 evenings and weekends.

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and exp in mfg and 1 year exp in systems development	to £11,500
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and exp in mfg and 1 year exp in systems development	
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CONSULTANT - exp in mfg and 1 year exp in systems development	£12,000
PROGRAMMER for mfg and 1 year exp in systems development	to £9,000
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in mfg and 1 year exp in systems development	to £9,000
ANALYST PROG. for ICI 2500 Plant Min 3 yrs, good applications exp and mfg	
<b>SAUDI ARABIA</b>	
SYSTEMS ANALYST to co-ordinate and verify systems changes to mfg and 1 year exp in systems development	£10,000
ANALYST PROG. for ICI 2500 Plant Min 3 yrs, good applications exp and mfg	to £9,000
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Write to: telephone 021 643 1994  
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**HOLLAND & U.K. VIA I.A.**

Our client, a multi-national company marketing a wide range of electro-mechanical components and electronic devices throughout Europe, requires an

**Analyst/Programmer**

to assist in the development and implementation of a modern Network system using IBM GSD equipment. At least 3 years COBOL experience, together with a sound analysis background in a commercial environment, should be demonstrated. A knowledge of German would be advantageous.

Location: Amsterdam plus European travel. Ref: 101/82  
Contact: Mark Clifford.

**Software Engineers**

experienced in one or more of the following areas:  
microprocessors — digital electronics — telecommunications — process control — networking — real-time monitoring — data communications — systems software

Location: London, Home Counties and South Wales Ref: 201/82

**Software Authors**

and programmers with a flair for writing good documentation to produce user manuals and programmers guides. World processing experience in a small systems environment an advantage.

Location: Home Counties Ref: 301/82  
Contact: Edith Watson.

Take this opportunity to discuss these and other requirements by phoning 0452 57141 (days or (0234) 46111 (evenings and weekends) or write to:  
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IA is a registered Employment Business licensed by D of E.

**Manager**

£10,275 - £11,517 p.a.

For the Information Technology Centre at Truro. To set up and run this exciting development in the training of unemployed young people. Applicants, male or female, should have management experience and extensive experience in microcomputers or microprocessor engineering. The post, which is temporary, is funded from income received from the Manpower Services Commission. Application forms and further details may be obtained on receipt of a stamped addressed envelope from the Principal, Cornwall Technical College, Truro, Pool, Redruth. Closing date 30th July, 1982.

**Cornwall**

**HYDRAULICS RESEARCH STATION LTD.****SENIOR ANALYST PROGRAMMER**  
0640-28128**2 ANALYST PROGRAMMERS**  
0642-27885

The Hydraulic Research Station is replacing its 1945 with an ICL 2900/29/29/29/29 system. The Computer Unit has vacancies for programmers to support this system and a network of PDP11 minis with RSX/DEC software. Degree, HNC or equivalent and some knowledge of a scientific language is required. Three years' scientific VME experience is required for the senior post, whilst knowledge of VME or RSX would be helpful for the other positions. Flexible working hours. Apply to the Establishment Office, Hydrology Research Station Ltd., Howbery Park, Wallingford, OXON, OX10 8DU. Tel: (0461) 35381, Ext. 270. (0138)

**County of Cleveland****COMPUTER SERVICES UNIT****Project Manager—Development**  
£9,729-£10,926 (Pay award pending)

Requires a team of about 14 staff in the development and maintenance of batch and on-line systems. Detailed techniques are widely used. A good working knowledge of ANS COBOL on-line and on-line techniques within an IBM environment are desirable, although the qualifications required will be initiative, leadership and the ability to apply processing skills to a wide range of Council business. This is a senior position offering a challenge to a person having a serious approach to a rewarding career. The successful candidate must also demonstrate a mature attitude and managerial ability. The work is interesting and varied and there are ambitious prospects for advancement. For further information and application forms please see the PHONIC COLIN SCHNEIDER ON 0640-28128 (0640-28128) or alternatively, write to the Director of Computer Services, 5th Floor, Red House, 67 Corporation Road, Middlesbrough, Cleveland TS1 1LY.

**COMPUTER SYSTEMS SALESMEN**

To service and expand dealer network in the following areas: North East, North West, Midlands and South West with South Wales.

Telephone in first instance: 0492 672

**E.D.P. DEPT. MANAGER/PROGRAMMER**

Systems Analyst Programmer required to manage small installation using NCR 6250 Mini Computer for International trading group based London. E.C.S. area. Minimum of 3 years Cobol programming essential and implementation of systems an advantage. Scheduled staff pattern. Pension scheme. Salary negotiable. Write giving full details of age, experience and salary required to: **0209 252111** for further details. (0175)

**COMPUTER OPERATOR**

c. £8,500

The DP team here at Alperion operate standard commercial packages — covering stock control, finance, order entry and warehouse applications — using IBM System 3 and Wang VS80, and provide full DP support for a number of divisions of Warner Communications Inc. Recent expansion within the group means we now need to appoint an additional Operator to work a progressive shift system which will provide one week off in three.

We are looking for someone with a good general education and at least 2 years' IBM System 3 experience. Training on Wang VS80 will be provided if necessary.

Salary will be negotiated around £8,500 including shift allowance. A range of large-company benefits includes 5 weeks annual holiday, subsidised canteen and discount on company products.

Please telephone or write for an application form to: Personnel Department, WEA Records Limited, PO Box 99, Alperion Lane, Wembley, Middlesex. Tel: 01-998 0766

**COUNTY CONSTABULARY SENIOR SYSTEMS ANALYST**  
£8,991-£10,581

This is a senior appointment in the Computer Team which is responsible for the development and introduction of computer applications in the County Constabulary.

Preferably educated to degree or final professional level, applicants should have practical experience of programming and at least five years' experience of systems analysis and design, ideally in a local government environment. Management experience is desirable and the ability to communicate effectively at all levels is essential.

Essential user car allowance payable.

Application form returnable by 19 July from the Personnel Officer, Kent County Constabulary, Sutton Road, Maidstone, phone (0622) 85432, ext. 212.

**KENT COUNTY COUNCIL****ANALYST — PROGRAMMER**

Salary Range APE — PD2  
£7371 — £9226 (National Pay award pending)

Eastbourne is a prestigious South Coast holiday resort with a wide range of facilities. The Council's Computer Department is unusually wide, and in addition to all normal functions, includes a transport undertaking, farms, highways, Agency, and extensive catering and entertainment facilities. The above post offers an opportunity for a versatile computer person to participate in the development and enhancement of both batch and On-Line Systems, as a member of a small development team in a progressive computer environment. The successful applicant will have the opportunity to work in a mixed machine environment of ICL 2900, GMD, PDP11 and PDP1144 equipment. Programming languages include COBOL, BASIC and PLAN. Experience of at least two languages would be advantageous, but appropriate training will be given where necessary. Conditions of service are good, and temporary housing, relocation and relocation expenses are available in appropriate cases. Further information may be obtained from Miss Shipley, Computer Services Section, Tel: (0323) 21335, Ext. 833, and application forms from the Borough Treasurer, Grove Road, Hove, BN2 4PW. Closing date 30th July 1982.

Commuting to the city every day can be difficult, tiring and expensive. But for at least two talented computer professionals, here's a vastly better alternative. NBC Computer Services at Reigate provides computing facilities for operating companies of the National Bus Company in the South-Eastern region. Right now we're looking for the following people to become involved with the implementation of Univac based systems designed as part of the Group Strategy, together with maintenance of existing ICL and DEC systems.

**PROJECT LEADER £9,600 — £10,800**  
You must have several years computing experience and have successfully completed at least one project from initial investigation to implementation. Experience of on-line minicomputer systems is desirable.

**SYSTEMS ANALYST £8,100 — £9,500**  
At least two years systems analysis experience is essential. If you would like any further information on these vacancies telephone Gordon Foster on Reigate 43321 or write today, with full details to K. W. Duckitt, General Manager, NBC Computer Services, Midland House, Vernon Road, Edgbaston, Birmingham B16 9SJ.

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The people we seek will have an engineering background and at least two years experience in a managerial role.

For further information please contact **BILL LAMER ON 01-629 7262 (24 hours)**

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A major financial service organisation are currently offering bright P.L.I. programmers a chance to broaden their experience and develop their careers within a growing environment.

A significant part of the work will include on-line applications, distributed processing systems and TOTAL database.

Current hardware is a large mainframe front-ended by a powerful mini which supports numerous terminals.

Excellent promotion prospects for go-ahead candidates.

Contact Jenny Burr on 01-629 8863.

**Junior Systems Analyst City c£9,500**

This financial institution wish to recruit a junior analyst, whose previous background will have included some proven analysis exposure possibly in an analyst/programmer role.

The ability to communicate effectively with both DP and non DP personnel is essential.

Career prospects are excellent within this progressive IBM installation.

Contact Jenny Burr on 01-629 8863.

**Programming Team Headers****North London c£12,000+ profit share**

This highly successful marketing distribution company, with a highly sophisticated computer-aided distribution network, currently requires senior programmers or Team Teachers for Management positions.

The programming team headers will assess junior staff, interview and be involved with all other management duties.

The successful candidate should have a minimum of 5 years' Cobol programming experience, coupled with one year's exposure to CICS, DL/1 and IMS database. An excellent profit sharing scheme is in force, combined with discounts on company products. Contact Jenny Burr on 01-629 8863.

**Analyst/Programmer Berks. to £15,000**

Proven IBM Cobol skills combined with a sound knowledge of Financial Systems are the primary experience areas sought by this client based in a very accessible part of Berkshire. In addition the ability to communicate really effectively at all levels (D.P. and non-D.P. personnel) is essential. This is an excellent career opportunity for the candidate possessing the necessary experience and professional attitude as the salary and benefits will demonstrate.

Contact Tom Bowles M.I.D.P.M., M.B.I.M. 629-8863.

**Systems Analysts West Middx****£12,000+**

Our client, a very successful international manufacturing and marketing organisation, is seeking experienced IBM analysts able to demonstrate a good general understanding of commercial business systems.

Specific experience of financial and marketing applications in an on-line environment would be advantageous as would an appreciation of Cobol programming. The ability to communicate effectively at all levels is essential.

In addition to excellent salaries and benefits the company offer real opportunities for career advancement.

Contact Tom Bowles 629-8863.

**Senior Systems Programmer (I.B.M.) Berks to £14,000**

Client with a very progressive installation is seeking a software professional with substantial experience in the area of Telecommunications, e.g. ACF/VVAM, NCP, etc.

The hardware and software in use make this a real career development opportunity with the job security and benefits one would expect from a substantial, successful organisation. Contact Tom Bowles 629-8863.

**I.B.M. Cobol Programmers - West Middx and Berks £10,000+**

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First-class career prospects, benefits and job security combined with 'state of the art' D.P. environments. Salaries will not be a restricting factor for really exceptional applicants.

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**FREELANCE****Programmers - Home Counties**

IBM, Cobol, CICS, DL/1 and IMS Database. IMMEDIATE START.

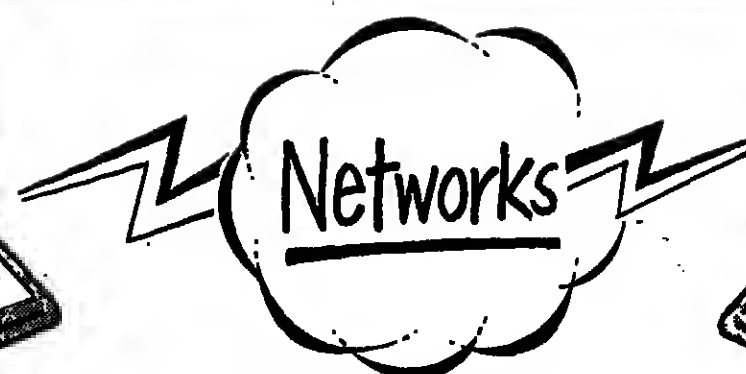
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# Hodge Recruitment

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Hertfordshire

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**Senior Programmers to £12,000**  
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Our client is embarking on the development of one of the largest multiple node networks of computer communications systems in Europe. Being a large, successful manufacturing company they have the facilities and credibility to handle a project of this size. Early study and planning phases are initiated but the main design and implementation teams will be newly recruited.

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**Senior Team Leaders/Consultants** will have several years systems software implementation experience, typically at operating systems level on minis and micros. They are expected to have a good appreciation of hardware architecture. Experience of communications systems would be advantageous.

**Senior Programmers & Programmers** will have two or more years experience of systems software implementation or technical applications development on minis or micros. Essentially they will be bright people who will be attracted by the scope and challenge offered by a project of this magnitude.

Usual successful company benefits including relocation assistance where appropriate.

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(10010)

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**Systems Analyst** - will have gained sound knowledge of Commercial Systems ideally gained on small equipment and a working knowledge of RPG II would be advantageous.

**Analyst Programmers and Programmers** MUST have RPG II experience preferably but not essentially gained on IBM equipment.

Suitable applicants who are seeking to enhance their experience in a busy and challenging environment should contact: Ken McIntyre or Peter Robinson on 061-737 7352 or write to the address below.

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For contracts in the South and Midlands contact Alan Morton.

(0100)

## EXCELLENT CONTRACTING OPPORTUNITIES

Our immediate domestic and international consulting needs are detailed below. If you are of a professional disposition, skilled and dedicated, and wish to join our permanent or contract staff, please contact us in respect of these and future opportunities.

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to rationalise data communications networks

Valuable career experience  
 in software development.

Harmondsworth, Middlesex Up to £11,340 (under review)

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We now need a number of Programmers at various levels at our West London Centre (close to Heathrow Airport) to support and develop data communications software facilities. Specifically, they will help achieve a greater degree of integration among the several major on-line systems and terminal networks that we control, where the spread of hardware uses both manufacturers' and in-house operating systems.

To be considered for a Senior Programmer post you must have at least 3 years relevant DP experience and a 1st or 2nd class honours degree. For Programmer posts you need at least 18 months experience and a minimum of 2 'A' levels or equivalent.

All applicants should have experience of on-line working and possess some knowledge of data communications. The ability to work at assembler level is important. A working knowledge of IBM or ICL operating systems would be an advantage.

Depending at which level you join, starting salary will be up to £11,340 (with subsequent progression to £13,580), or up to £9,490 (rising to £11,720). All salaries quoted are currently under review. Benefits include flexible working hours and a contributory pension scheme. Excellent prospects of promotion.

For an informal discussion about the work, ring John Steele on 01-759 2644. For an application form please contact Sheila Humphreys, British Telecom, Room 8113, Tenter House, 45 Moorfields, LONDON EC2Y 9TH. Tel: 01-432 9355.

(1010)

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 Communications and Information Systems

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Dear Future Employee,

Our client, Afia Worldwide Insurance is seeking to augment its programming staff with people to work on new and existing projects. Their need is for experienced Cobol and/or RPGII programmers with good IBM expertise. Afia already have a development team of 20 people, all of whom are totally committed to an exciting future. This American owned company is truly Worldwide and their computing facilities are being actively upgraded and expanded to meet growing business. In return they offer highly competitive salaries and are Prepared To Pay what is necessary for candidates with the right skills; a pleasant working environment in the City Of London; an excellent training programme will be provided.

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Don't miss Your Opportunity to join Them!

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IBM 4331	ANALYSTS
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Five figure salary package plus car

We are a progressive and innovative Systems Company committed to the development of the UK's largest and easily most sophisticated Integrated Communications Network. We currently support well over 50 remote sites and our own microwave telecommunications network and in response to ever increasing demands for extra facilities, we seek to strengthen our Data Communications Support Group.

The Group provides a first-line dawn to dusk support service that encompasses all associated hardware and software problems as well as responsibility for new implementations. Candidates should have a minimum of 5 years experience in

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The role offers significant freedom to the individual with a high degree of customer contact and an element of travel and time away from home. Candidates interested in discussing this position in greater detail should telephone Alan Carnell on 021-236 3761 (24 hour answering service) or 021 784 6063 (Evenings and Weekends 7-9 pm).

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021-236 3761

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Manchester M3 2JA  
061-833 0427

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Our client, one of the foremost telecommunications companies in Europe are looking for a number of people to work either in Switzerland or Italy. To qualify for a position in Switzerland you should have several years of in-depth telecommunications experience in Switzerland or similar, preferably in Vax equipment. You must also speak fluent English. To work in Italy you must have had experience at either ITT System 3240 or Gammex. To work in Italy you must have had experience at either ITT System 3240 or Gammex. To work in Italy you must have had experience at either ITT System 3240 or Gammex. To work in Italy you must have had experience at either ITT System 3240 or Gammex.

### SYSTEMS ANALYSTS/LECTURERS

c £11,000 BERKSHIRE

If you are a really experienced Systems Analyst with experience of VME and/or IBM or TPMS or indeed any other TP machine and you are looking for a change, this could be your opportunity. Our client is looking for people who would like to use their O.P. knowledge and communication skills to train people to become effective Systems Analysts. Call for further details.

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£11,500 - SURREY

Ideally applicants should have minimum four years' experience on IBM equipment, under OOS or DOS/VS and CICS. Programming background advantageous but not essential. Applicants must have done major project from implementation to support. Applications include sales, purchase and financial ledgers. You will also be required to develop for project Manager. Excellent career prospects and fringe benefits.

### PROGRAMMERS

£8,000-£12,000 LONDON AND HOME COUNTIES

CALLING ALL IBM COBOL PROGRAMMERS

If you have a minimum of two years' experience under OOS/DOS/VS, with or without CICS, our client would like to hear from you. VME/CMS or OLI would be an added bonus. We offer a large selection of interesting positions, high salaries and fringe.

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LONDON SW1V 1DE

TEL: 01-836 6775 (24 HOURS)

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If you have experience of COBOL, RPGII, RPGIII, Fortran or Assembler on mainframes, minis and/or microcomputers within commercial or scientific environment we want to hear from you.

Our clients offer attractive packages with salaries ranging from £7,500 to £13,000, and the chance to live within easy reach of the South Coast and London, with all the benefits of rural life.

INTERESTED? Then contact: Derek Stanley on Crawley (0293) 514071, 9 a.m. to 6 p.m.

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34 The Boulevard, Crawley  
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Integrated Systems for Engineering

### IBM CONSULTANT

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## Computer Training

The Computing Division of the Rutherford Appleton Laboratory uses a wide selection of equipment including IBM, PRIME, GEC and ICL PERQ computers, and a variety of graphics devices from simple terminals to a sophisticated micro-film recorder. The most commonly used languages are FORTRAN, PASCAL and BASIC. A number of packages and libraries are used including the GINO-F graphics system and several database systems.

A computer training organiser is required by the Computing Division to design and run courses for staff and users of the Laboratory computing equipment.

Initially the person would take responsibility for the intensive training scheme for Junior Staff recruited directly from local sixth forms.

Further training courses are envisaged, at various levels, for both professional computer staff and scientists who intend to do their own programming.

The person recruited must have teaching experience, a general level of computing knowledge, be able to organise, liaise with teachers and computing specialists and be keen to gain a broad knowledge of the Division's computers and the languages and software systems in current use.

The post is based at the Chilton site and will be in one of the following grades:

Scientific Officer 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

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Closing date for applications: 30th July 1982

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IBM COBOL  
IBM OS COBOL  
IBM COBOL, CICS & DL1  
IBM PL1 Various requirements  
IBM B100, DPPX, DPCX, COBOL  
IBM SYSTEM 34, RPG II  
IBM 4300 RPG II  
IBM COBOL, CICS & OPAC  
IBM CICS (DMS)  
IBM IMS DB/DC PROGRAMMER  
SYSTEMS DESIGNERS  
IBM CICS COBOL  
IBM CICS, VTAM, COBOL/ASSEMBLER  
IBM MARK IV  
IBM PL1, SHADOW  
IBM System Programmers  
IBM MVS COBOL SHADOW IDMS  
IBM Assembler on-line DATABASE & TASK MASTER  
IBM SYSTEM 38 RPG III  
IBM PL1 to COBOL CONVERSION expertise  
HONEYWELL Level 6 COBOL SCREEN WRITE  
HONEYWELL DPS4, IPS, COBOL  
HONEYWELL DPS8 COBOL  
PROGRAMMERS  
ICL Applications Manager  
ICL ME29 COBOL  
ICL VMEB, IDMS  
ICL Renge COBOL  
ICL SYSTEM 10 ASSEMBLER  
ICL SYSTEM 25 ASSEMBLER  
ICL Software Programmer VMEB (S3)  
PDP RSTS/E BASIC + or BASIC + 2 (some with DATABOSS)  
PDP RSX11M BASIC + 2  
VAX BASIC  
VAC COBOL  
SYCOR Expertise  
HP3000 COBOL  
WANG COBOL or BASIC  
FORTRAN PROGRAMMERS  
PASCAL PROGRAMMERS  
TANDEM any levels (URGENT)  
CORAL 66  
VENTEK DATAPOINT, DATABUS  
DATA GENERAL INFOS COBOL  
8088, MDS, ICE, MTOS, PLM Programmers  
VARIAN V77 COBOL ASSEMBLER  
Hardware Engineers

Software Engineers  
CMC REALITY SM1 package  
SYSTEM X  
Contact: STEVE WHITING, NEIL SMITH,  
STEVE CASEY, DEREK WADHAM, DAVE PEART, DAVE  
LONKHURST,  
KEITH TAYLOR, PETER HOLLIDAY,  
MARK ATKINSON or SANDRA CAREY

#### URGENT

ICL COBOL VMEB  
SOME WITH IDMS or  
TPMS  
40 REQUIREMENTS  
ASAP

#### URGENT

CORAL 66  
ANALYSTS + PROGRAMMERS  
LONG TERM START ASAP - AUGUST B2

#### OVERSEAS 0252 516141

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and ADABAS. Manufacturing applications.  
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SHIFT LEADER  
on long term

Contact: ALAN PAINE

#### MIDLANDS & NORTH 021-742 4431

ICL VMEB COBOL IDMS or TPMS  
All levels  
IBM, PL1 All levels  
IBM CICS DL1 COBOL  
IBM COBOL with IMS  
IBM SYSTEM 34 RPG II A/P - Mersyside  
UNIVAC 1100 COBOL  
IDMS DATABASE Administrator  
Analyse Various Systems  
PDP RSX11M BASIC + or BASIC + 2  
PDP/RSTS/E BASIC +  
FORTRAN PROGRAMMERS

URGENT  
IBM ANALYSTS manufacturing back-  
ground ASAP  
UNIVAC OS3 RPG PROGRAMMERS  
RTL 2 Programmers

Contact: NEIL E. SMITH or  
KAREN LONGCROFT

#### PERMANENT VACANCIES 0252 516141

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This is just a small selection of current ICL requirements. For details of these and others not advertised, call us now.

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- ★ not less than 12 months experience in Systems Analysis.

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The Company also requires a Trainee Programmer with knowledge of COBOL, who has either recently qualified or has a few months experience - salary £5K to £6K.

Candidates, male or female, should in the first instance contact **JEFF WALTON** on 061 236 1157 (daytime) or on 061 962 0002 (evenings and weekends until 9.00 pm).

(0181)

**INTERFACE**  
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## CONTRACTS PROGRAMMERS

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IBM 4300	TOTAL	AUGUST	SUSSEX
IBM COBOL	IMS	JULY	BEDS.
IBM COBOL	VSAM	JULY	HANTS.
ICL SYS 1D	ASSEMBLER	JULY	BEDS.
ICL ME28	COBOL TP	ASAP	LONDON
ICL 2900	COBOL SCL VMEB	ASAP	BERKS.
ICL 2900	PASCAL VME	ASAP	BERKS.
ICL 2900	COBOL IDMS	ASAP	VARIOUS
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## ANALYSTS & SYSTEMS PROGRAMMERS

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